The Mining Journal

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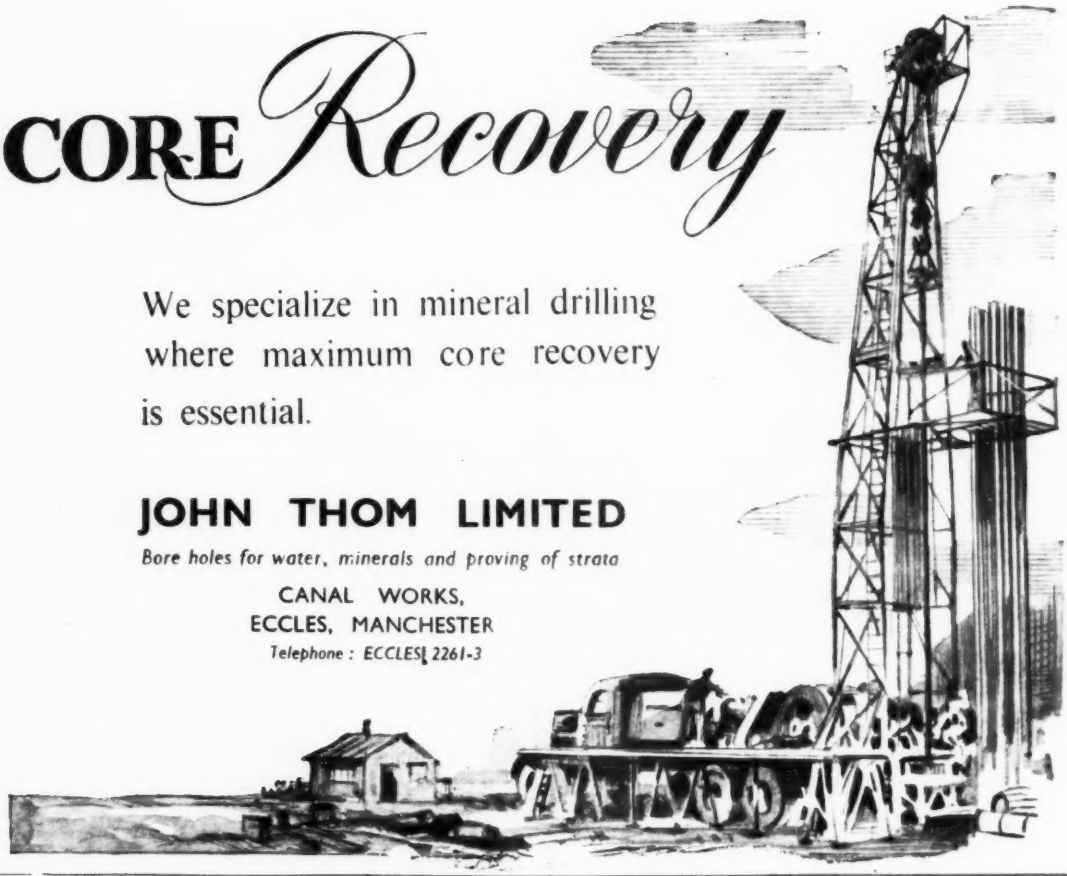

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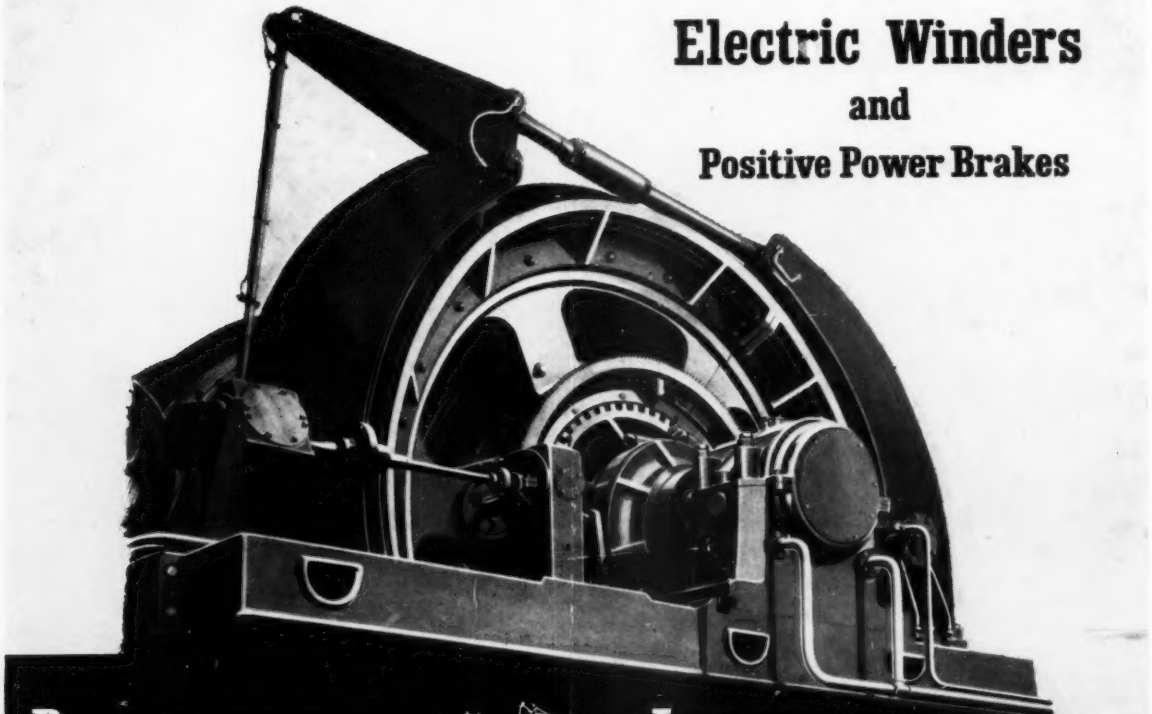

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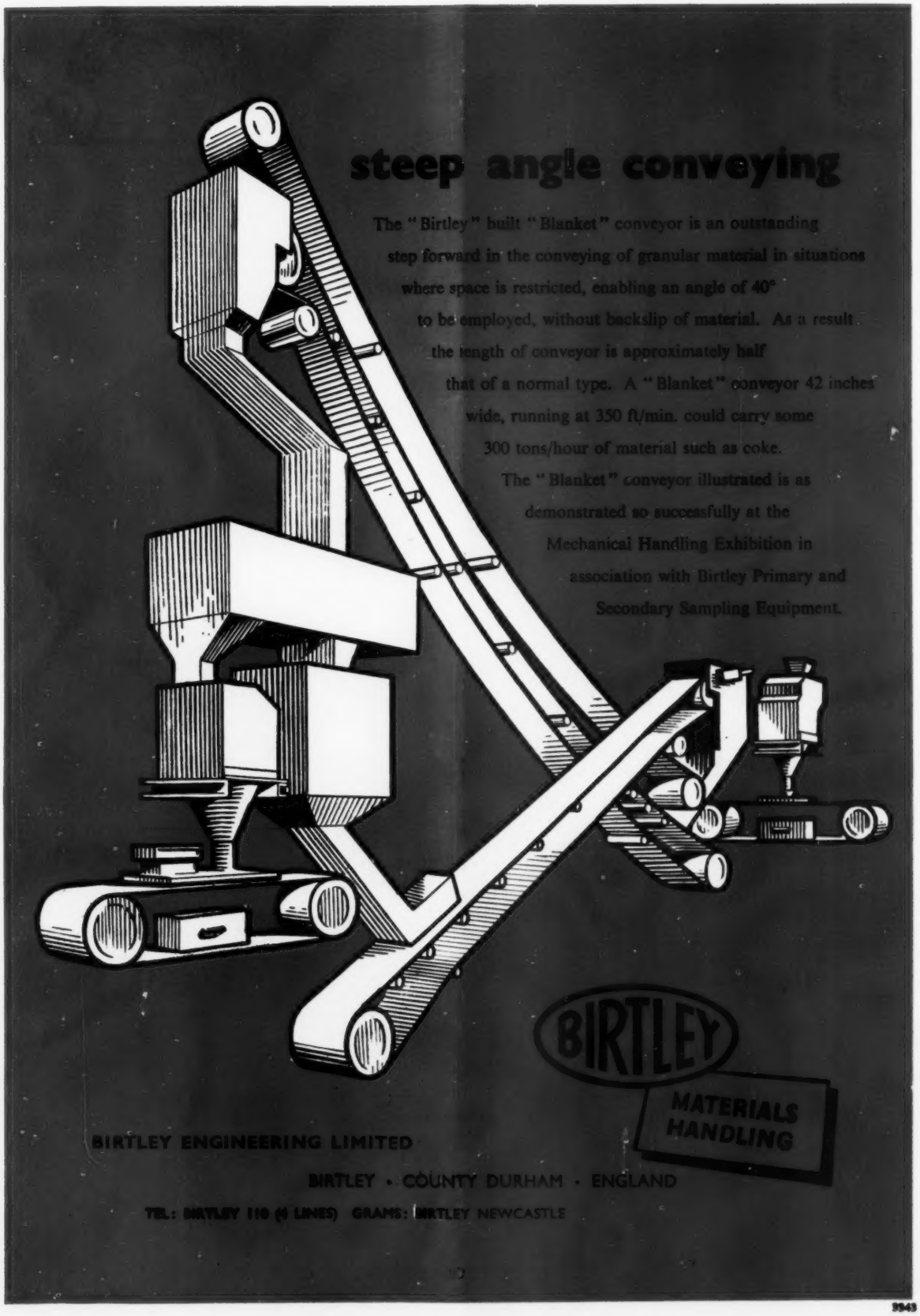
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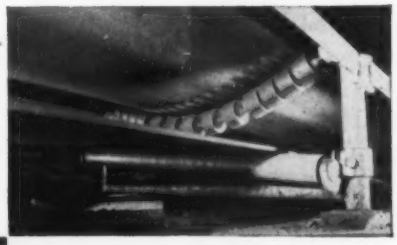

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DRILLING SOME OF THE HARDEST ROCK IN THE WORLD

Atlas Copco drills and Sandvik Coromant steels brought in to do the job at the Orkla pyrite mine, Norway

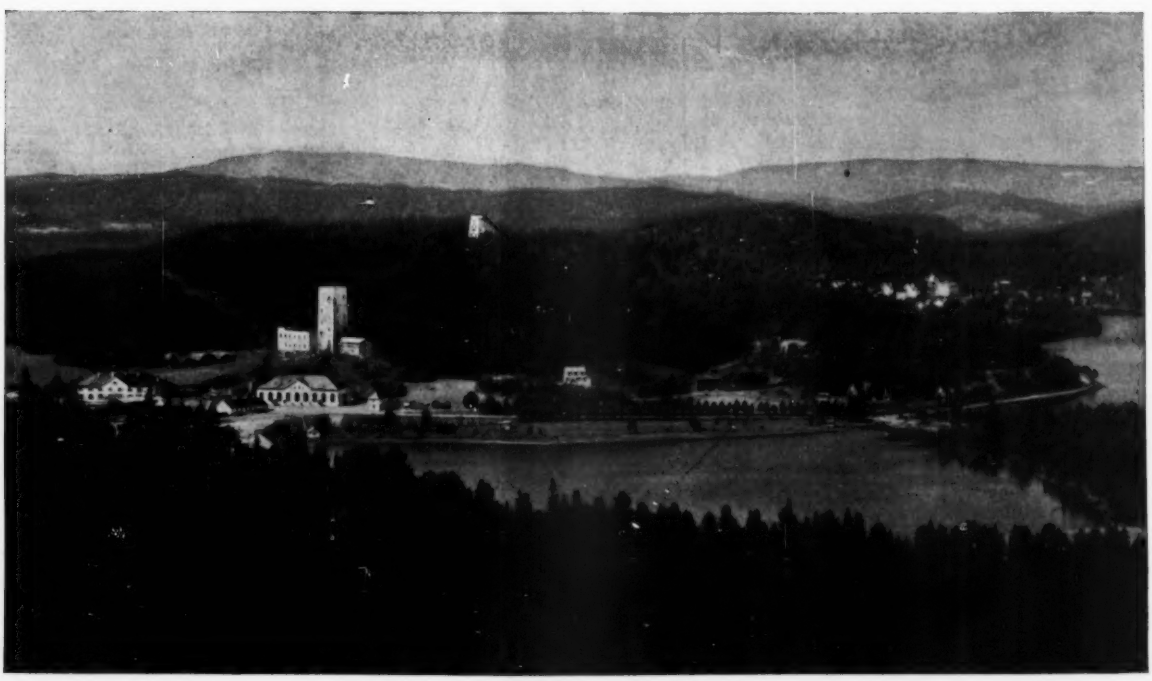
The Orkla pyrite mine is by far the largest of its kind in Norway and has been in operation for 300 years. About 350,000 tons of the ore are mined annually, most of it going to the Orkla metallurgical plant producing elementary sulphur and copper matte.

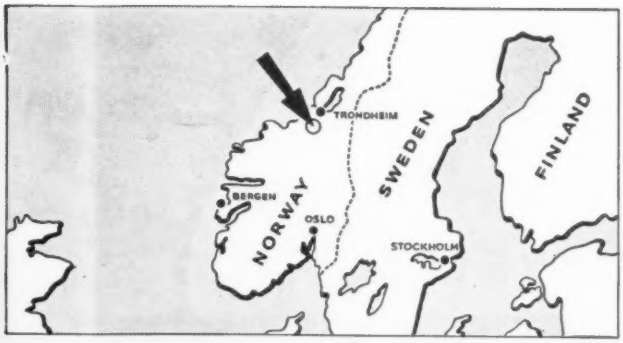
The Orkla pyrites are a fine-grained tight structure and contain finely-distributed quartz. The ore is exceptionally hard; *said to be the most difficult in the world to drill.* Over the years, 90 different types of rock drills and numerous grades of drill steels have been tested in the mine. The most recent and most successful have been special Atlas Copco rock drills fitted with Sandvik Coromant tungsten-carbide-tipped steels. *These drills have now been adopted throughout the Orkla mine.*

The drilling technique at the Orkla mine previous to the introduction of tungsten-carbide drilling was based on the use of one-inch hexagonal hollow carbon steels with 6-point star bits and 134-pound stopers mounted on columns. Progress was anything but smooth. Seizures were often experienced and drill steel wear was considerable. Over one ton of steels was used per machine to drill a five-foot round, requiring about 400 steels altogether. Again, one steel was redressed per ton of raw ore produced, and up to 24 drillsmiths and 12 haulers were engaged on this work.

Revolutionary change of method

There is no doubt about it at all. Tungsten-carbide drilling —the combination of Atlas Copco drills and Sandvik Coromant steels — has completely modernised and speeded up production at the Orkla mine. First tests with





Above: *Stoping at the Orkla mine with an Atlas Copco rock drill and a Sandvik Coromant tungsten-carbide-tipped steel. This equipment has now been adopted extensively throughout the mine.*

Right: *The Atlas Copco drill specially developed for the Orkla pyrites being tested down the mine.*

tungsten-carbide steels gave advances of ten inches after each regrind and a total footage of fifty inches per steel. The steels were then modified to suit local conditions and, in addition, Atlas Copco also got to work developing a special rock drill, the BBE 12DK, for the Orkla pyrites. This machine weighs only 54 pounds, is mounted on a pneumatic pusher and has a striking power of 4,800 one-inch blows per minute.

Now, steels go 50 feet in hard rock

The special Atlas Copco drills and Sandvik Coromant steels were finally introduced extensively throughout the Orkla mine in 1953 after footages of as much as fifty feet had been obtained per steel. Today, the steels go 2.6 feet or more before a regrind and equipment in the redressing shop has been reduced to 4 grinders and 3 haulers. Standard Atlas Copco drills fitted again with Sandvik Coromant steels have also been adopted for drilling jasper, which occurs in the Orkla mine. Here too, Atlas Copco equipment and drilling methods have scored another great success. In greenstone, the predominant rock, footages up to 1,000 feet per steel have been obtained.

The outstanding performance put up by Atlas Copco drills and Sandvik Coromant steels at Orkla is being repeated again and again on mining and construction projects all over the world. This equipment is in such wide use that it is responsible for the drilling of no less than one billion feet annually!

The Atlas Copco Group puts compressed air to work for the world. It is the largest group of companies specialising solely in the development and manufacture of compressed air equipment. It embraces Atlas Copco companies or agents manufacturing or selling and servicing Atlas Copco equipment in ninety countries throughout the world.

For further information about the equipment featured please contact your nearest Atlas Copco company or agent. There are Atlas Copco companies in Wembley (England); Paris; Rotterdam; Milan; Brussels; Copenhagen; Oslo; Stockholm; Essen; Madrid; Istanbul; Nicosia (Cyprus); Casablanca; Benoni (Transvaal, S.A.); Ndola (N. Rhodesia) and Belmont (S. Rhodesia); Montreal; Paterson N.J. and San Carlos Cal. (U.S.A.); Torreon (Mexico); Aubern (N.S.W., Australia); Wellington; Rio de Janeiro; Santiago de Chile; Lima. If you have difficulty in contacting your local Atlas Copco organisation please write to Atlas Copco AB, Stockholm 1.

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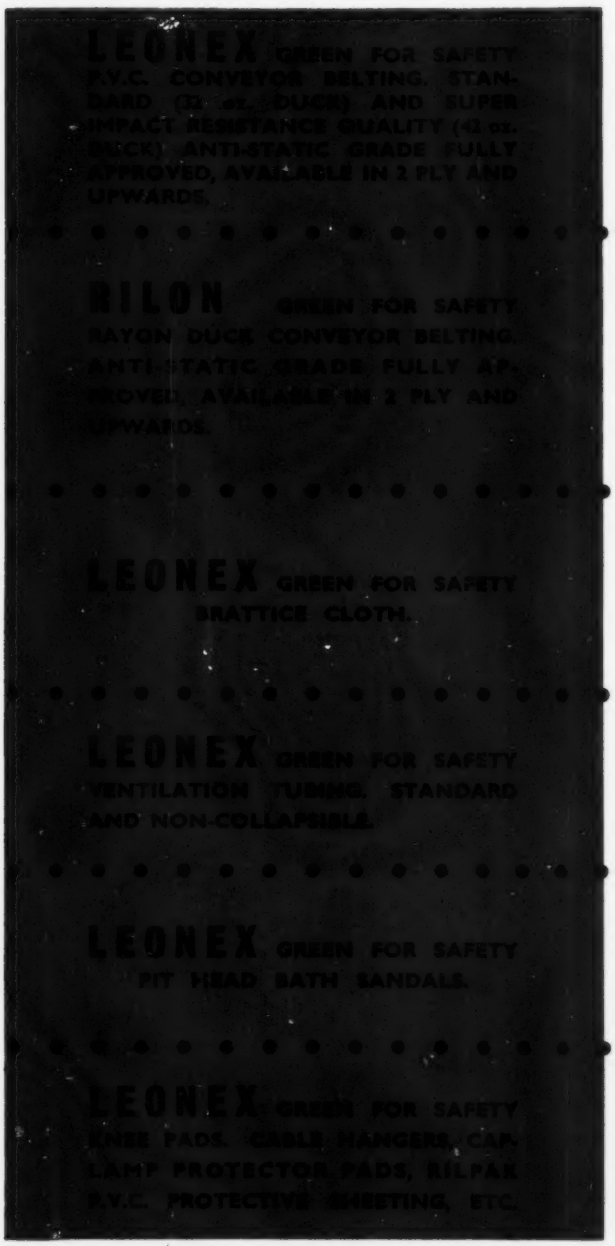
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The Mining Journal

London, October 12, 1956

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The Nigger in the Nuclear Pile

A FEW weeks ago the U.S. Atomic Energy Commission announced a programme for continuing and extending co-operation with friendly nations in the field of uranium exploration. This offer of further assistance, though doubtless inspired by the loftiest motives, can scarcely have been wholly disinterested, for the A.E.C. seeks to augment the immense uranium sources of the U.S. by encouraging exploration in other Free World countries.

Much stress has been laid in recent pronouncements on the key role which is foreseen for nuclear power in the progress of territories where economic development is still at an early stage. It is hardly surprising, therefore, that in countries where known reserves of nuclear materials are limited, there should be some reluctance to export minerals on which a national atomic industry might be based.

This attitude is apparently being adopted by Brazil, which has denounced agreements for the purchase by the U.S. of monazite and thorium in exchange for wheat and also for technical assistance in the search for uranium and the purchase of any surplus not required for its own atomic programme. A third agreement, still in force, concerns the utilization of atomic energy for peaceful purposes, under which Brazil is to receive 13.2 lb. of U 235 for a research reactor, now under construction by Babcock and Wilcox at a cost of U.S.$800,000 for delivery at Sao Paulo University in January (see *Mining Journal*, December 23, 1955, p. 737).

Our Brazil correspondent reports that the shipment of 300 tons of thorium, provided for in the 1956 contract, has been cancelled and President Kubitscheck has approved the broad lines of a new policy to be adopted in relation to nuclear energy. These include: creation of a special fund for prospecting, development of nuclear energy and training of technicians; a national industry to be promoted for prospecting and processing atomic minerals; the government to control purchase, stocking and commerce of atomic minerals; exports to be suspended until full information is available regarding national resources and requirements; the government to enter into short-term contracts with any friendly country for the exchange of atomic minerals against nuclear equipment and the establishment of an atomic energy industry in Brazil.

The President of the Atomic Energy Commission explains that, although there is every indication that Brazil has considerable reserves of atomic minerals, the actual volume has not yet been measured. The contract with the French Iare Earths Company to instal plant at Pocos de Caldas will only become effective if the local zirconium deposits prove to contain an economic percentage of thorium.

Having regard to the possibility that other countries might also become increasingly unwilling to export raw materials for the nuclear industry, it may be anticipated that the U.S. government will intensify its efforts to assure future supplies by means of long-term contracts with other countries. In view of its critical dependence on imported materials, this is also a precaution which

Britain in particular cannot afford to neglect.

It might be argued that contracts of this nature are losing their value because there is no longer any assurance that they will be honoured. The outlook for humanity would be dismal indeed, however, if faith in the sanctity of agreements between nations were to be destroyed by the actions of a few perhaps not overscrupulous governments.

MICROBIAL SULPHUR

The production of metals by synthesis seems as yet some distance off, but scientific research is already leading to the development of methods of supplementing the supply of certain elements hitherto obtained primarily from mining operations. An indication of the unexpected sources from which future requirements might be derived is afforded by microbial production of hydrogen sulphide, which can be converted to elemental sulphur or sulphuric acid by well-established chemical methods. An exhibit illustrating this novel process was on view at "Open Days" held recently at Teddington by the Chemical Research Laboratory of the Department of Scientific and Industrial Research.

The United Kingdom is largely dependent on imports for its supplies of both elemental sulphur and pyrites; hence the critical sulphur shortage which arose a few years ago directed attention to indigenous materials as potential sources of supply.

In 1950 two members of the Microbiology Group, C.R.L., organized an expedition in the Cyrenaican desert to examine certain lakes in which some hundreds of tons of elemental sulphur were being produced annually. They found that the sulphur was formed by the combined action of sulphate-reducing bacteria producing sulphide from dissolved gypsum and photo-synthetic sulphide-oxidizing bacteria *(Chlorobium* and *Chromatium),* which in bright sunlight converted the sulphide into elemental sulphur. Formation of sulphur by this process suggested that some of the non-volcanic sulphur deposits in various parts of the world might have been laid down in a similar manner. It seemed possible that sulphur production might be induced by providing the required conditions for bacterial action.

The principal materials required for microbial sulphate reduction are (a) sulphate, of which there are plentiful supplies in the U.K., and (b) reducing material equivalent to the amount of sulphate to be reduced; this may be either a suitable organic material or hydrogen gas.

A survey of raw materials showed that sewage sludge was the only suitable reducing material which was cheaply available in sufficient quantities to make an appreciable contribution to sulphur requirements. A process has been developed at the C.R.L. for sulphide production from raw sewage sludge enriched with sulphate (e.g., by adding gypsum, anhydrite or waste sulphate from fertiliser manufacture). Normal digestion of raw sludge produces a gas mixture containing approximately 70 per cent methane and 30 per cent carbon dioxide. In the C.R.L. bacterial process the final gas mixture also contains hydrogen sulphide which is present in sufficient quantity to permit the economical recovery of sulphur.

The results obtained from laboratory erperiments have been confirmed by pilot plant trials at a sewage works. Trials with a 450-ton tank are now contemplated and a production of about half-a-ton of sulphur daily is anticipated from 25 tons of sludge. From the full quantity of sludge available, a daily production of 45 tons of sulphur could be obtained.

At this stage it would be premature to foresee in microbial sulphur any threat to the sulphur mining industry. The economics of the new process have yet to be determined. It may well be cheaper to extract sulphur from the ground; whether in elemental form or as pyrites, than to produce it by bacterial or chemical means. In the long-term future, however, when minteral resources as we know them become exhausted, the world may well become increasingly dependent on the chemist and the bacteriologist to provide alternative sources of supply.

AUSTRALIAN MINING NEEDS STIMULANTS

The proposed tax-free mining zone for Australia (*vide The Mining Journal,* of October 5, p. 390) reflects a widespread feeling of apprehension at the failure to discover large base metal or gold deposits in the Commonwealth and, with the exception ot work by a few strong groups, the neglect of re-examination of the many abandoned mines, large and small. Our Australian correspondent points out that the present prosperity of the Australian mining industry, excepting uranium and beach sand mining, depends entirely upon the old mines which have been producing for as much as 70 years. Obvious causes of lack of public interest in recent years have been high operating costs and shortage of competent labour since the war, together with the high wages and the exceptional living conditions offered by city and town-based manufacturing industries.

Probably the most serious deterrent, however, is taxation, an aspect stressed by Mr. Julius Kruttschnitt, of Mount Isa Mines Ltd, who stated that more liberal tax laws on mining could greatly stimulate the development and production of mineral resources, and cited the Canadian example, pointing out that there initial production from any mine is granted a tax-free period of three years, and in addition, the writing off of plant and pre-production development expenditure is allowed. In Australia, with the exception of gold and uranium production, company profits and dividends in the hands of shareholders are permitted a tax exemption of only 20 per cent, and a similar concession is allowed on calls paid on the capital of mining companies. Actually, dividends should be regarded as return of capital until subscribed capital has been repaid. A quite heavy burden on the industry is Pay Roll Tax (2½ per cent levied on wages paid) which rises automatically with increase in wages rates.

The Australian mining industry offers ample scope for profitable investment, both in established producers and in new developments, but in the latter case taxation is the serious deterrent. A difficult problem is recruitment to the mining engineering profession, and the small number of students entering the Universities and other mining schools is becoming increasingly perturbing. Reason for the apathy, and the trend to manufa turing industries in the cities and large towns, is that all branches of engineering are displayed for all to see; the mining industry is remote and relatively inaccessible to the great public.; it is an unfortunate fact that to the great majority "mining" is a word; what the indusry is in fact, is quite unknown, and is completely overlooked in the choosing of careers for boys.

Much attention is being given to the problem; films are circulated, displays are set up at exhibitions, careers booklets descriptive of the main features of the industry are distributed, scholarships are given by mining companies. A very important step has been taken by The Australasian Institute of Mining and Metallurgy in inviting a number of

science teachers to the recent Institute congress at Broken Hill and Port Pirie, a step which, it is hoped, will have an important influence on recruitment to the profession.

COMPRESSED AIR PLANT IN INDIA

India's Second Five Year Plan, for the years 1956-57 to 1960-61, sets up ambitious targets in many fields. Total expenditure under the plan is Rs. 7,200 crores (£5,400,000,000). The general expansion of industries is likely to create a rising demand for compressed air plant in many sections of the Indian economy, including the mining and quarrying industries.

Coal production is scheduled to increase from 38,000,000 tons in 1955-56 to 60,000,000 tons in 1960-61. This includes the opening up of a number of new mines under public ownership, and these, it has been stated, will be on the most modern lines. The use of modern equipment is likely to include pneumatic drilling and cutting gear. As regards other minerals, the following are the proposed levels of production by the end of the Second Five-Year Plan.

	1954	1960-61
Iron Ore	4.31	12.5
Manganese Ore	1.41	2.0
Limestone	Not available	23.3
Gypsum	0.61	1.97
Bauxite	75	175

(It should be noted that all outputs are given in millions of tons, save that of bauxite, shown per thousand tons).

The air compressor most commonly in demand in India is the portable reciprocating type, diesel driven. The commonest sizes are from 110 c.f.m. to about 315 c.f.m. Portable rotary models are likely to come into greater use than at present when there is wider understanding of their operating advantages. There is some demand for stationary models of up to 1,000 c.f.m., but deliveries of much more than 1,000 c.f.m. are often provided by the use of multiple units.

The U.K. accounted for between 60 per cent and 70 per cent of Indian imports of air compressors in the four years between 1952-53 and 1955-56. In the field of portable diesel air compressors from about 100 c.f.m. to 500 c.f.m., U.K. offers compete strongly with those of European manufacturers, although a number of U.K. prices are consistently higher than those of West Germany and Austria. For stationary compressors of larger sizes, the U.K. prices compare much less favourably. U.S. prices are generally substantially higher than those of the U.K. and other European manufacturers. Swedish prices of portable compressors are generally higher than the run of U.K. offers.

With the prices of different suppliers frequently converging, the awarding of contracts is often determined by other factors. The most important is perhaps delivery, since the keynote of India's economic planning is speed. Most foreign manufacturers, including British, are usually able to offer immediate or early delivery of portable compressors.

Reputation also counts. A good reputation is usually based on the reliability of the equipment supplied and the availability of servicing facilities. U.K. makes of air compressors have a good name in India, sufficient to offset minor price disadvantages. Servicing is particularly important.

Several schemes for the manufacture in India of compressed air equipment are believed to be under consideration. Some of these would involve British participation; an Austrian and a Swedish firm are also believed to be interested. Government of India approval has been given for a scheme for the manufacture of air compressors in India by a U.K. firm in collaboration with an Indian company.

In a report on the market in India for compressed air plant (Ref. ESB/21055/56), the Board of Trade emphasizes the desirability for a U.K. manufacturer of compressed air plant to be represented in India by a competent agent; preferably one who can hold stocks and spares and one having good connections with government authorities and industrial users. The agents should also be able to provide prompt and reliable servicing facilities.

Air compressors are subject to import control. Licensing arrangements are announced at half-yearly intervals.

COAL FACE MECHANIZATION

Probably in no other field of mining operations can Britain's National Coal Board feel so satisfied as when reviewing the progress made in coal face mechanization. Despite the limitations of comparatively poor operating conditions—judged from a national standpoint—the Board have persevered with commendable initiative in an endeavour to offset output lost by dwindling manpower by increase in individual productivity. That the results to date have not been so good as was hoped is no reflection on the machines. Nevertheless in 1955 almost 26,000,000 tons of coal were power-loaded at the face compared with 20,000,000 tons the preceding year and only 5,000,000 tons during 1947, the first year of nationalization. As by far the greatest proportion of British output comes from longwall faces particular attention has been paid to the development of machines for use on such faces, and at the present there are almost 450 longwall power-loaders of all types in use.

Obviously the great variance in environmental conditions militates against standardization and no one machine—or even type of machine—is capable of universal application. However, the Board are co-operating closely with manufacturers both at home and abroad and recently all areas made a special review of all faces at work, or planned to start work before 1958. On the basis of this review the nine divisions estimated the number of machines they will need and drew up programmes for installing them. The fulfilment of these programmes depends largely on the rate at which manufacturers can turn out the equipment and the success of the Board's efforts to secure and train men to operate the machines.

The formation of these long term plans gives the mining machinery manufacturers ample opportunity to plan accordingly and judging by past records they will not be found wanting in producing the goods. Hand in hand with the production of proved machines goes the programme for the evolution of new types. However, for the present it is the existing machines which must carry the burden, and beginning this week *The Mining Journal* is publishing the first of several articles dealing with power-loading machinery which can be said to have passed the trial stage. Part I of this series provides an introduction giving the broader outline of the essentials of coal face mechanization and in subsequent issues the author will give an account of the application of the more important types of longwall machines in use in Britain and the Continent.

Britain's continued prosperity depends upon the ability of her miners to produce the coal: the tools will be given, let them finish the job.

MECHANICAL CUTTING AND LOADING IN COLLIERIES—I

Power Loading in Britain

By J. M. CAW

Although coal production has shown a steady increase since the end of the war the tonnage won has not kept pace with rising internal consumption, and the United Kingdom has been importing coal at the rate of some 1,000,000 tons each month. This figure cannot easily be increased, limitations being imposed by import facilities and shortage of dollar reserves, since American coal seems to be that most likely available. Britain is faced, therefore, with the necessity of increasing production, but the situation is such that the method of doing so is no longer left to choice. There is little alternative, in the face of a worsening manpower situation brought about by rising industrial productivity in other industries, to the remedy of increased mechanization in British collieries. The exhaustion of collieries, increasing depth of mining and greater transport distances underground as working faces recede from the winding shafts, are all factors which aggravate the situation. In this issue we commence a series of articles that summarizes available knowledge on the methods and equipment used in mechanical cutting and loading in British collieries.

THE primary objective of production must be increased output from the coal face. As this rises other difficulties follow in train until a bottleneck arises elsewhere. In many instances this has already happened. The armoured conveyor has done much to simplify the work of coal getting, and the extensible prop that of support. Considerable manpower is required on support work, which is an operation only part adaptable to mechanization. For the most part, however, a prop free front is not an impossible aim and it is possible, in some cases, to mechanize entirely the operation of getting and loading.

No single method can be the universal panacea for all coal-getting difficulties and a large number of ideas must be developed to give operational efficiency over a wide variety of face conditions. Considerable research has already been directed to this end, and it is the purpose of this series of articles to describe a selection of cutting and loading equipment which has reached the operational testing stage and to give an idea of its capabilities.

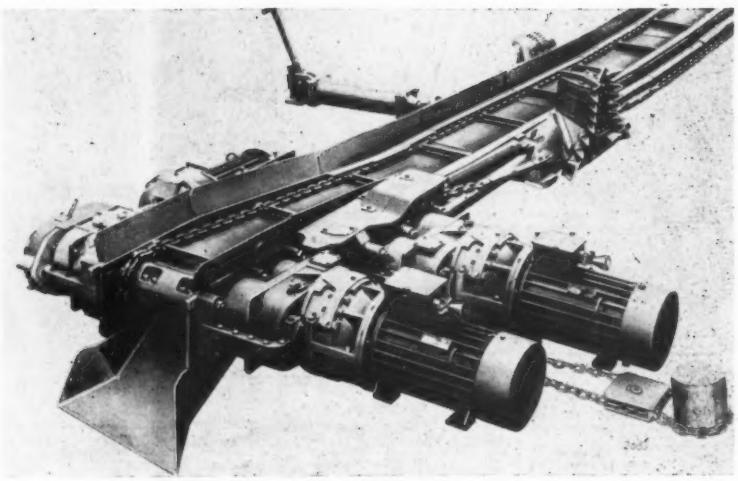
The O.M.S. figures for the years 1947-1955 from deep mines in this country are well illustrated in the table opposite. It can be seen that, although substantial advances have been made in recent years, there is still room for improvement. The aim of mechanization must be to increase the total output, not only to increase the O.M.S., which must be regarded merely as an essential incidental. Every set of circumstances gives rise to its own particular problems and will result in a choice of mechanized methods varying from cutting by machines mounted on the panzer conveyor, to use of the plough, and caterpiller tracked loaders such as the Dosco Miner, cutting on a buttock.

As a rule, dust production increases with the power used, and this is true in general, but not invariably, of the size of power-won coal when compared with that got by hand methods, although the amount of powder used will influence this greatly. Increasing the tonnage of small coal may have repercussions on the coal cleaning plant, and, with certain grades of coal, an important bearing on the price obtained, but this should not be allowed to stand in the way of increased production under normal circumstances, and any possibility of increasing output by using any machine should be grasped.

Value of Planning

It is at once apparent that any new project in an existing mine will raise many difficulties, but most of these can be foreseen, and overcome with careful planning. They vary from personnel training to difficulties of electrical and mechanical engineering and economics. The greatest importance should be attached to an initial venture into face mechanization. An area offering the most favourable conditions for success should be selected for the early experiments and first installation, so that the enthusiasm of the men may be more easily fired. Specialist advice should be sought and accepted. The manager and under-manager should show their interest and see that the men detailed for work with the machines are fully conversant with their work, in theory and to some degree in practice, before using them underground. Time studies must form an essential part of any new development.

From the start it is profitable to allot a generous period of maintenance work, since any involuntary stoppage is expensive. Continuous loaders can probably best be maintained on the third shift when stoppage is usually necessary, in any case for other work to be kept up. The capital cost of a fully mechanized face is quoted as being £20,000 to £30,000 higher than a conventional face, and it is therefore essential that such a face should yield a tonnage increase sufficient to pay for depreciation of plant and interest on



The Westphalia Lunen Panzer conveyor and Anbauhobel, fitted to work as part of a rapid plough installation

the capital invested. These may amount to £6,000 p.a. and the cost per ton represented on the annual tonnage won can therefore be easily calculated.

Another way of considering this is as a required tonnage increase found by dividing 6,000 by the per ton cost of coal getting and loading, although some savings will also be made per ton on the other operations required to put the coal on rail by virtue of increased output.

At the present time about 90 per cent of the total mined coal production of the United Kingdom comes from longwall faces. The various coal cutting and loading machines may be considered, therefore, chiefly from the standpoint of longwall face operation. It is also of interest that 80 per cent of the mined coal comes from seams ranging from 2 ft. 6 in. to 6ft. in thickness, the actual distribution for 1952 being:

PROPORTION OF OUTPUT ACCORDING TO RANGE OF SEAM THICKNESS

Year 1952

Seam Thickness	*Percentage output*	
1′ 11″ and under	2.1	
2′ 0″ — 2′ 2″	2.8	
2′ 3″ — 2′ 5″	4.4	
80% 2′ 6″ — 2′ 11″	12.1	
80% 3′ 0″ — 3′ 5″	12.0	36.5
80% 3′ 6″ — 3′ 11″	12.4	
80% 4′ 0″ — 4′ 11″	26.7	
80% 5′ 0″ — 5′ 11″	16.9	43.3
6′ 0! and over	10.9	27.5
	100.0	

Total output (raised and weighed) 233,758,000 tons.

Seam thickness is obviously one of the most important factors governing the choice of mechanized mining method. Before giving further consideration to coal getting, however, some mention must be made of the necessity for a prop free front and the provision of a suitable conveyor at the face.

Hand shovelling of coal broken by blasting, or picks, on to conveyor belts of the rubber, or non-snaking chain type, was common practice in many mines for some years. With the introduction of the flexible panzer type conveyors, with their capacity to resist rough usage, more efficient working has become possible using mechanical cutting and loading, and the development of improved mechanization at the face is closely tied to their use. The older types of belt are not usually used over face lengths exceeding about 140 yds. The newer flexible chain armoured types, however, using high quality chain into which as much as 200 h.p. can be fed, may be used in units up to 200 or 250 yds. in length in level seams and, where the grade is in favour of the load, lengths in excess of 300 yds. have been used. As much as 350 tons of coal per hour can be carried on the larger fast moving conveyors. A compact model having a capacity of 300 tons per hour which is suitable for thin seam working and which illustrates the main features of these conveyors is illustrated, fitted to work as part of a rapid plough installation.

Either electric or compressed air motors can be provided and the range of operation of this particular example is up to about 330 yds. Gradients of 1 in 4 against the load or 1 in 2 in favour of the load are within its sphere of application. The width along the face is about 24 in.

Useful Alternative Features

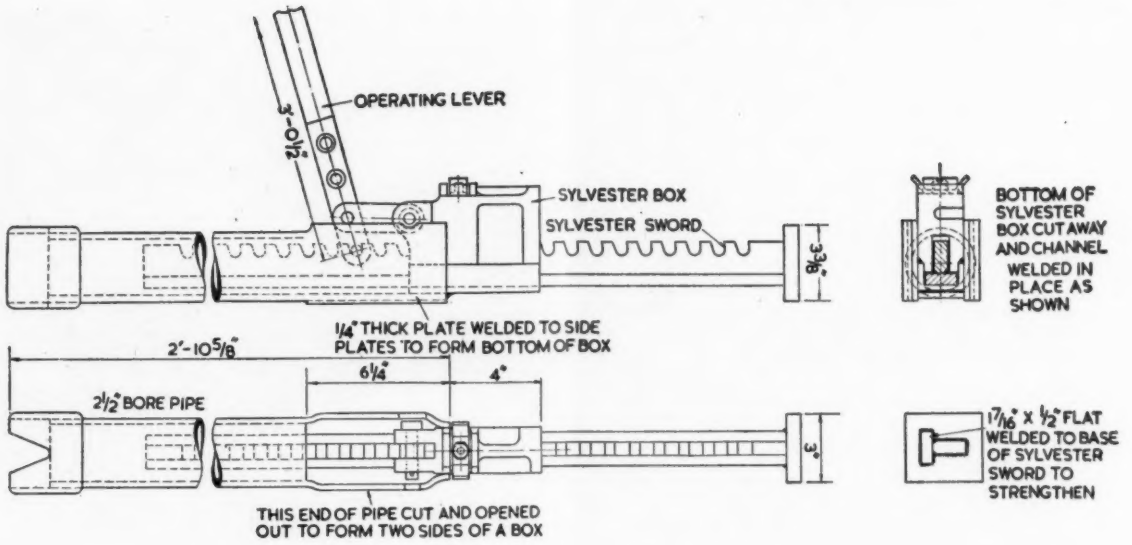
Useful features include alternative drive mounting positions, dual drive, drive at both ends, hydraulic cylinders for advancement of the conveyor towards the face, etc. A few of these points are illustrated overleaf, where five arrangements are shown for a Mavor and Coulson armoured conveyor of comparable size.

The smooth side walls of the conveyor frame can be used as supports or as rail tracks for various types of coal cutting and loading machinery and the impact of coal falling on the conveyor will not damage it. With two motors driving at each end 220 h.p. can be supplied to the model shown. The degree of misalignment permissible to follow irregularities of the floor or face is 4 deg. at each joint, and these are approximately 5 ft. apart. Conveying

DEEP-MINED SALEABLE OUTPUT PER YEAR AND OVERAL O.M.S. — 1947 - 55

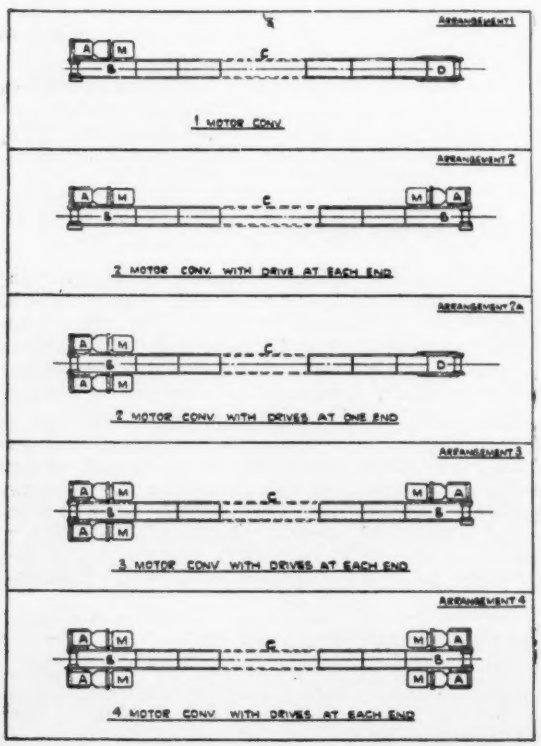
Year	1947	1948	1949	1950	1951	1952	1953	1954	1955
Saleable Output (000,000 tons) ..	187.2	197.6	202.7	204.1	211.9	214.3	212.5*	213.99	210.23
O.M.S. (tons)	1.07	1.11	1.16	1.19	1.21	1.19	1.21	1.231	1.225

* Affected by extra week's holiday and Coronation holiday.


OPERATING LEVER
2'-0½"
SYLVESTER BOX
SYLVESTER SWORD
3¾"
BOTTOM OF SYLVESTER BOX CUT AWAY AND CHANNEL WELDED IN PLACE AS SHOWN
¼" THICK PLATE WELDED TO SIDE PLATES TO FORM BOTTOM OF BOX
2'-10⅝"
6¼"
4"
2½" BORE PIPE
3"
17/16" x ½" FLAT WELDED TO BASE OF SYLVESTER SWORD TO STRENGTHEN
THIS END OF PIPE CUT AND OPENED OUT TO FORM TWO SIDES OF A BOX

Above : Modification of Sylvester jack. The design used at Denaby Main Colliery

Below : Five arrangements of 50 h.p. to 200 h.p. Mavor and Coulson armoured conveyor. A, gearbox and fluid coupling; B, head structure and grading troughs; C, intermediate structure; D, tail and grading troughs; M, a.c. motor or air turbine


ARRANGEMENT 1
1 MOTOR CONV.
ARRANGEMENT 2
2 MOTOR CONV. WITH DRIVE AT EACH END
ARRANGEMENT 2a
2 MOTOR CONV. WITH DRIVES AT ONE END
ARRANGEMENT 3
3 MOTOR CONV. WITH DRIVES AT EACH END
ARRANGEMENT 4
4 MOTOR CONV. WITH DRIVES AT EACH END

speeds of 128 or 102 ft. per min. are obtainable using alternative motor gearing. The life of a chain and trough section may be expected to exceed two years.

Armoured conveyors are made by a number of manufacturers in this country and various features are offered, but the main design points are well exemplified by that already described. In practice the use of mechanical aids is not always as simple as anticipated. For instance, if a conveyor is fitted so that it can be moved closer to the face by pneumatic cylinders each of these must be fed by flexible hose, and it is surprising how much maintenance is required to prevent multiple leaks at joints and in the line from causing loss of working efficiency and the appearance of slovenly organization. In some respects jacks of less advanced design may prove more advantageous in the long run. Sylvester jacks, modified for the purpose, have been found very useful.

Ninety per cent of the total mined output is now mechanically conveyed, but only some 11 per cent is power loaded.

The Prop-Free Front

It is generally agreed that total caving with a prop-free front offers the most favourable conditions for thorough face mechanization. How closely this ideal can be approached depends upon local conditions, and what use can be made of modern support equipment. The easiest conditions will be provided by a strong roof and floor, which must not, however, be too strong to break behind the line of props as the face advances. On the other hand, if surface subsidence must be considered the fullest possible support by waste pack may be required. If the floor is soft or the roof on the strong side, it may be necessary to provide a strong breaking line.

The modern chock, such as the Dowty with its 20 ton setting load and 80 ton yield pressure, goes far to provide this. Release of a gradual or sudden nature can be obtained, thus adding to the safety of withdrawal. An hydraulic travel of 18 in. is available in a chock of 3 ft., closed height. Hydraulic advancing rams have also been used with these chocks, showing a time saving of 2.21 minutes over that required to advance the Dowty chock by hand, and 3.13 minutes over the time taken to advance a steel chock having a mechanical release.

Mining Sulphur Underwater in the United States

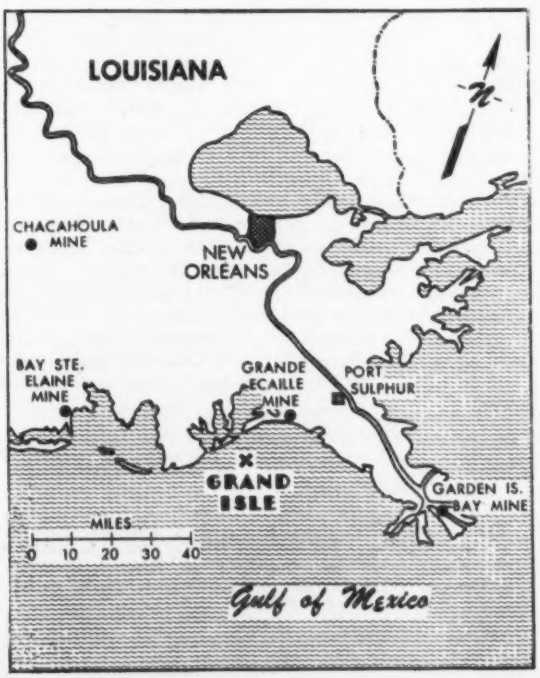
The vexed question as to what action an oil company can take to develop sulphur deposits discovered while drilling for oil on certain sites is now being debated by the U.S. Department of the Interior. Humble Oil and Refining discovered vast sulphur deposits while drilling for gas and oil six miles out in the Gulf of Mexico, in ground originally leased from the State of Louisiana but now under Federal control. Humble wishes to pass the mining rights for sulphur to Freeport Sulphur Co., but Federal leases permit either sulphur or oil developments, but not both. State-sold leases, however, allow for development of several minerals. This is the first time the question has been raised. The accompanying article describes the site and deposit, as well as the operational plan mapped out by the companies themselves.

THE first completely offshore sulphur mining operation in history has been planned by Freeport Sulphur Company at a deposit discovered in the Gulf of Mexico by Humble Oil and Refining Co. The deposit, located off Louisiana in 45 ft. of water six miles from the nearest land, represents a major new source of sulphur, according to a joint announcement by Mr. H. H. Baker, president of Humble Oil and Refining, and Mr. L. M. Williams, president of Freeport Sulphur.

Under a contract signed by the two companies Freeport will design, install and operate a mining plant to produce sulphur by the Frasch hot water process. Construction is required to begin by the latter part of 1958 and is expected to take two years to complete. The deposit, known as Grand Isle, Block 18, was discovered by Humble in the course of offshore oil exploration, and ranks among the most important sulphur discoveries of recent years.

The Grand Isle sulphur was found approximately 1,700 ft. below the floor of the Gulf of Mexico in the caprock of a salt dome, a geological formation commonly found in the Texas and Louisiana Gulf coastal area. Grand Isle will be the first sulphur mining operation to be conducted in the open waters of the Gulf of Mexico. It will be a new and novel undertaking, but one for which Freeport is especially qualified because of its experience in mining sulphur at marshland and partially submerged locations.

Indeed, Freeport already has developed and successfully operated three sulphur mines in the coastal marshes. Two of the mining plants were erected on 75 to 95 ft. piling, and the third was built on a barge, floated to the site, and sunk in place. The company also pioneered the use of seawater in the Frasch process and marine transportation of sulphur in molten form, innovations which will greatly facilitate offshore operation.



The contract also involves sulphur rights in two other offshore domes, known as Grand Isle Block 16 and West Delta Block 30. Block 16, where sulphur has been discovered by Humble Oil and Refining, is about five miles west of the Block 18 deposit. Block 30, where Freeport will continue prospecting begun by Humble, is 12 miles to the east.

Under the contract stipulations Freeport Sulphur will pay basic royalities to the Federal government and will pay to Humble certain royalties the effect of which is that Humble and Freeport will each receive after taxes approximately 50 per cent of the net profits from Freeport's operation of the properties.

Production of sulphur from beneath the floor of the Gulf will be entirely different from production of oil. The Frasch process, whereby superheated water must be fed continuously into the formation to melt the sulphur which in molten form is forced to the surface through wells, requires a heating plant of great capacity and weight. This plant and all other installations will have to be built on a tall steel structure, out of reach of storm waves. The structure will be the largest of any of the permanent structures in the Gulf of Mexico.

In the absence of storage space, insulated barges will shuttle the sulphur in molten form to Port Sulphur, storage and shipping point about 25 miles away. On the return trip, the barges will haul fresh water necessary for boiler makeup and auxiliary services. The Gulf itself, however, will supply the millions of gallons of water required daily for injection into the wells at high temperature.

Power for

FOR the economic production of aluminium, cheap and abundant supplies of power are a necessity. According to Alcoa it takes one kilowatt-year to produce 1,000 lbs. of primary metal. The aluminium industry consumed roughly 5 per cent of the total kWH. produced in the U.S. last year. It used approximately 31,300,000,000 kWH. to produce slightly more than 1,500,000 s. tons of aluminium.

Given low power costs, as in Canada and Norway, the cost may represent as little as 7 per cent of the ingot value, but in most other areas, where power costs are higher, electrical energy may approach 20 per cent of ingot value. In 1951, when aluminium produced in the U.S. was selling at 18 c. per lb., the cost of the electricity used to produce it was nearly 2 c. based on two mills per kW. hour.

In Turkey electricity costs rather more than ten times as much to produce and in economically undeveloped territories power costs are even higher. Over most of Asia, Africa and Latin America, abundant and accessible conventional fuel supplies do not exist.

Hydro-electric power has been the lowest-cost energy on which the aluminium industry has been developed. It is still regarded as the best, although it is not without its Achilles Heel, since drought conditions may result in an abnormally low flow of water with critical effects on the power supply, as experience in Canada and Scotland showed last year.

Sources of Power

The hydro-electrical power potential in many European countries, including the United Kingdom, is now largely committed, but North America still has rich water power resources awaiting development. In this respect Canada is more favourably situated than the U.S. The latest Canadian project involves a new power plant costing $150,000,000 on the Peribonka River, which will provide current for an additional 120,000 tons of aluminium smelting capacity in the Saguenay region. On the other hand, U.S. aluminium producers are being obliged to consider alternative sources of power. Since the 1930's, the aluminium industry has turned towards Federal hydro power rather than the construction of water-power projects, principally because the Federal Government has assumed control over most water-power sites and has the right of recapture of private projects under the Federal Water Power Act of 1920. In 1950 about 90 per cent of the output of primary metal in the U.S. was obtained from hydro-power, two-thirds of which was Federal hydro-power.

In recent years the three major U.S. producers of primary metal have been unable to obtain substantial additional power from Federal sources for their expansion programmes, while the diminishing number of remaining hydro-electric sites that are economically desirable in other respects suffer in being located remotely from centres of industrial activity and from markets. Most of the new aluminium capacity in the U.S. is therefore based on coal or gas or lignite as the source of power. The major producers have closely studied the related economies of fuel cost for electric power, consumed as a raw material in aluminium production, *vis-à-vis* proximity to markets.

Because of the uncertainty regarding power supplies the aluminium industry in the U.S. has gradually been extending eastwards and is now divided geographically into three main parts — the Pacific Northwest, the Southwest Gulf of Mexico area, and the East. The Northwest (Washington, Oregon, Montana) gets electricity from vast water power. The Gulf area (Texas-Arkansas-Louisiana) gets it from natural gas and lignite. Up to now the Eastern production area (New York, Tennessee, North Carolina, Alabama) has obtained it from St. Lawrence and Niagara water power and from Tennessee and North Carolina water power.

These illustrations, showing a general view of Alcan's plant and harbour installations (above) and a tower of the transmission line (opposite) at Kitimat, British Columbia, reveal the high initial cost of a hydro-electric scheme

Although hydro-electric power is still the lowest-cost motivation force as yet employed by the aluminium industry, the tremendous cost of the initial installation of plant and the danger of drought combine to present it as a far from infallible method of production. Indeed, shortage of hydro-electric resources and the rising price of natural gas have brought coal right back into the picture, at least in the United States.

Aluminium

In the past decade expansion in the chemical, electrochemical and electrometallurgical industries has been particularly rapid in the Gulf Coast area because of its relatively cheap fuel. Meanwhile, however, new long-distance gas transmission lines were being laid down to carry the Southwest gas reserves to markets further afield. As the demand for gas rose, so did the cost, until the point has been reached when the price of natural gas at the well is broadly in line with that of oil and coal at the pit mouth. From all indications the price of natural gas is likely to continue rising.

Shortage of hydro-electric resources and the rising price of natural gas have now brought coal right back into the U.S. picture. The case for coal-fired electricity is particularly strong where ample reserves of high-grade coal are available and where modern techniques of mining make possible a high level of productivity. Where the coal lies in close proximity to navigable water, as occurs in a large section of the Ohio Valley, conditions are especially favourable for the development of economical coal supplies on the large scale required for aluminium reduction. Moreover, advantage can be taken of the waterway to bring bauxite, in semi-refined form (alumina) to the plant by barge. These favourable economic factors exist in the Ohio Valley, which is considered to be a natural location for the further expansion of U.S. aluminium production during the next 10-20 years.

Thus the current cycle of expansion is tending, for the first time, to base aluminium production on coal-made electricity combined with river-barged alumina. Bauxite will be moved by barge up the Mississippi and Ohio rivers, to the large new Eastern plants in Indiana, West Virginia and Ohio, where coal is plentiful and is not too expensive, due to the more extensive use of mechanization at the pits.

Up to the present the production of aluminium has been confined for the most part to countries with highly developed industries and the siting of reduction plants has been determined primarily by the availability of a cheap and abundant source of electrical energy. The raw material has been transported from countries overseas, some of it over great distances, for the world's greatest bauxite mines are situated in Jamaica, British Guiana and Surinam. Great interest is now being taken in, for example, the Gold Coast and French West Africa projects, where hydro-electric undertakings could be established near bauxite resources. There are, however, many features of any large-scale development in these and other undeveloped areas which call for very careful study. The relative lack of basic facilities such as transportation, communications, housing and trained labour pools demand large capital investments to lay the necessary foundations for large developments. Private capital is understandably reluctant to venture into new areas unless the prospective return on investment warrants the risks assumed.

Other Potential Production Areas

There are other parts of the world where hydro-electric power is potentially available on a very large scale, for example, it was stated at the World Power Conference in June this year, that India, Pakistan, China and Tibet, could create an international power project to supply the Bengal and Assam metallurgical industry with enough energy to produce five times the current world aluminium output. But the initial cost of a hydro-electric undertaking is extremely high.

It may well be that in the coming years the advent of atomic power will play a significant part in determining the location of aluminium plants. Not only does nuclear power appear to offer a means of releasing producers in the U.S. and other industrial countries from their present dependence on the proximity of conventional energy sources, but it might also make possible the establishment of reduction plants near bauxite deposits in economically backward areas without vast capital expenditure on hydro-electric schemes.

Machinery and Equipment

New Safety Instrument for Mines

An instrument named the Seismitron, imported from the United States, is being tested on the £400,000,000 Snowy Mountains hydro-electric scheme in Australia. The instrument predicts rock falls before they occur and is claimed to be the first successful scientific instrument to improve on the old safety practice of tapping the roof of a working area.

The Seismitron has been developed by the Liberty Mutual Insurance Co., United States, in association with the U.S. Department of Mines. The motivating force behind the years of research necessary was the high accident rate in the American mining industry. Presumably the spark plug that set research into action finally was the rock fall quota itself.

The great difficulty to be overcome in designing a detector was that sounds of rock movement were, for the most part, quite inaudible to the human ear. Audible sounds usually occurred just before a fall, and often too late for safety measures. While it was no great task to detect the inaudible sounds and amplify them, it was almost impossible to shut out extraneous inaudible noises, many of which were caused by elecrical equipment.

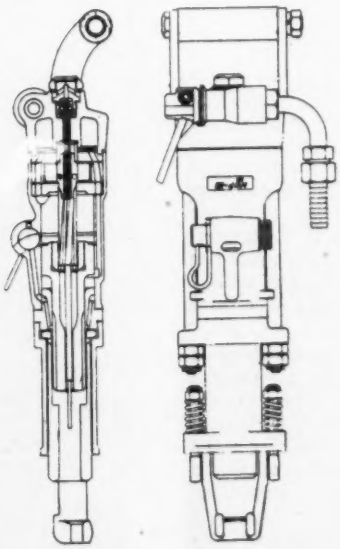
The development of the Seismitron depended upon the design and construction of high-fidelity equipment. So far, it is not claimed that even near-perfection has been achieved, and the instrument has distinct limitations. But research is still continuing, and the Seismitron meanwhile is achieving results—a claim no other instrument has been able to sustain.

The Seismitron has been described as an electronic stethoscope. It consists of a cylindrical pick-up or transducer, a carrying case and a pair of magnetic earphones. It weighs only 15 lb. Successful use of the instrument depends upon the operator's knowledge of the geology of the area and his experience in reading the signals. It is useless in the hands of an unskilled operator.

In operation, the pick-up (called the Seismiphone) is gently placed in a drilled hole, well within the rock formation. When a very minute rock movement occurs at a low level of intensity the Seismiphone, in close contact with the rock, moves. This motion causes the delicate crystal inside to move—perhaps .000001 inch or less—and this motion in turn is translated by the crystal into electrical impulses which are fed to the amplifier. The amplifier increases the sound level and supplies power to the earphones, which convert high-level electrical motion into high-level sound waves, which can be heard by ear.

DEVELOPMENTS IN POLISH MINING EQUIPMENT

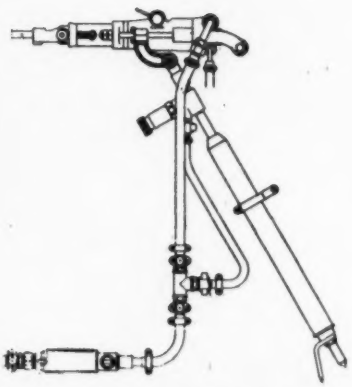
A process for preventing the freezing of coal in open trucks has been developed in Poland. The practice thus facilitates the unloading of coal during icy weather, and at the same time eliminates wastage



of both coal and cartage space which might occur due to the adhesion of coal to the sides of the truck.

The method depends on the use of special oil mixtures which are mixed with the coal in quantities in the order of one part of oil to every ninety-nine parts of coal.

Whereas the sprinkling of the coal with oil has proved ineffective, the mixing process is reported to prevent the coal from freezing, even when exposed to a temperature of −18 to −20 deg. C.



Since the cost of using the oil and coal-mixing process is high in Poland, owing to the high expenditure necessary to provide the oil required, further Polish experiments have been directed towards the use of methods for drying the coal by removing a large part of the moisture. It is currently believed that the oil mixing method may be sufficiently economical for its use under certain conditions when hard icing occurs.

Development is not confined to research alone, however, as general mining equipment itself is receiving marked attention in Poland. Four types of pick hammers for coal mining are produced in the country, differing only slightly as to power requirements and weights, and controlled by distributing sleeve or by plate distribution. Air consumption at about 1 cu. m./min. is limited and is almost equal in all types. These hammers range in weight from 7.5 kg. to 11.7 kg. and vary in stroke from 1,500 per. min. to 650 per min.

Pneumatic hammer drills of various sizes are used in shaft sinking operations and for tunnelling. The range varies from the WUP-11, weighing 13.5 kg. without cock to the WUP-20, weighing 22.5 kg. without cock. As the latter model is too heavy for manual labour, it is used in conjunction with the type PWU-51 support. The principle of operation is similar in all these models, the piston striking the drill rod under the action of compressed air.

NEW WAGON MARSHALLING EQUIPMENT

Fifty years ago the increasing demand by industry for quicker and cheaper unloading of bulk materials freighted by rail made the provision of wagon tipplers

Top right: Power drill WUP-20 with prop PUW-51 automatic lubricator

Centre: The WUP-20 power drill with blowing and washing out appliances

Left: A Seismitron, imported from the U.S. and used to predict rock falls, is being tested on the Snowy Mountains scheme in Australia. The instrument is expected to make revolutionary improvements to safety in mining and tunnelling practice

a necessity. To-day the same need exists but on a much broader basis, the present requirement being the general mechanization of equipment provided for unloading duties.

One of the most lengthy and costly operations involved in discharging materials in bulk from a train is the manouevring of wagons one by one on and off a tippler, usually by shunting-locomotives or winches. At many industrial plants, coal - fired generating stations, coke ovens and similar sites requiring large quantities of material, the contents of a number of trains have to be discharged each day, and it is to meet these requirements that the Fraser and Chalmers Engineering Works of The General Electric Co. Ltd. has developed and applied for a patent for a marshalling equipment to enable these operations to be accomplished with greater speed and economy.

The system enables many types of wagons to be handled, and in particular facilitates the discharge of all four-wheeled wagons used on British Railways, including the recently introduced 24½-ton capacity four-door wagon of hoppered and non-hoppered types, with or without power brakes. The system can be adapted to foreign gauges and to handle other types of stock. One tender has already been submitted.

The three units involved in the system are controlled by only one operator from the time a train of wagons is shunted into the full sidings until it has been discharged by the tippler and marshalled into the empties sidings. The units, referred to as A, B and C, operate as follows. Unit A advances the entire waiting train of wagons by one full wagon length, enabling the B unit to engage the leading wagon of the full train and marshall it on to the tippler cradle, at the same time displacing any empty wagon that may already be there. The final unit, C, moves forward the previously-discharged empty wagon and other preceding wagons into the empties sidings. The A and C units are driven by ropes from winches, and the B unit by means of a chain.

To begin the operating cycle the A unit is run to the end of its travel remote from the tippler, the swinging arm having first been automatically retracted by a track stop. A shunting locomotive then brings the full wagons (up to 16) to the siding leading to the tippler. All these wagons will pass over the A unit as its arm is retracted. The locomotive is not required while the train is being discharged, and is free for other duties.

The A unit winch is then restarted and on reaching a stop provided on the rails, the swinging arm is automatically set in the operating position. The unit is further advanced until the driving rollers are against the rear wheels of the rear-most wagon of the train and the wagons are then uncoupled.

The operator in the control cabin advances the full train of wagons by means of the A unit which propels them forward at a speed of 12 ft. per min. When the rear wheels of the leading wagon reach a control point the train will stop automatically. The train is now ready for discharge. As the unit moves forward, the driving roller engages a rear wheel of the leading wagon and moves it towards the tippler, the wagon stop being re-set automatically when the rear wagon wheels have passed over the control point. The B unit continues to propel the full wagon, at a speed of 60 ft. per minute, on to the tippler, the wagon being stopped in the appropriate position by the operator. Whilst the B unit is propelling the wagon on to the tippler, a limit switch operates, automatically starting the winch of the A unit, which moves forward the entire waiting train of full wagons by the length of the leading wagon.

The empty wagon discharged from the tippler by the oncoming full one, comes to rest in a depression formed in the track on the empties side. From this position it is moved forward by the C unit at a rate of 40 ft. per min.

A NEW BRITISH STANDARD

The British Standards Institution has recently published B.S. 2772:1956, which specifies iron and steel for colliery cage suspension gear, tub and mine car draw gear, and couplings and rope sockets.

This standard was authorized by the Iron and Steel Industry Standards Committee and is part of a general revision of British Standards for iron and steel for colliery haulage and winding equipment. Part 1 covers wrought iron and Part 2 wrought steel.

For a number of years it has been apparent that B.S. 291, B.S. 322 and B.S. 323 were in need of revision, since they did not offer a full range of suitable materials for the construction of colliery tub and mine car draw gear and couplings, and colliery cage suspension gear. For the manufacture of bridle chains and shackles. B.S. 322 specified only Best Yorkshire and Grade A wrought iron, whilst for rope sockets B.S. 323 included dead soft steel as the only alternative to these materials.

B.S. 2772, Parts 1, 2 and 3 dealing with wrought iron, wrought steel and steel castings respectively, cover the requirements of the mining industry in respect of materials for types of load-carrying components of haulage and cage-suspension gear. The materials have been selected after careful consideration of the particular conditions to which they will be subjected in service.

Parts 1 and 2 of B.S. 2772 are each divided into sections covering general requirements and specific requirements. *General requirements* for both parts deal with: dimensional and weight tolerance, the marking and provision of material for testing, and tensile and bend test requirements. *Specific requirements for Part* 1 cover "Best Yorkshire", "Special" grade, and Grade A wrought iron. *Specific requirements for Part* 2 cover 25/30 ton carbon steel, 1.5 per cent manganese steel and 50/70 ton tensile steel.

The appendices to both parts include tables of metric equivalents, and information on the forms of British Standard test pieces required for the purpose of the standard. The appendix to Part 2 also contains information on "ruling sections."

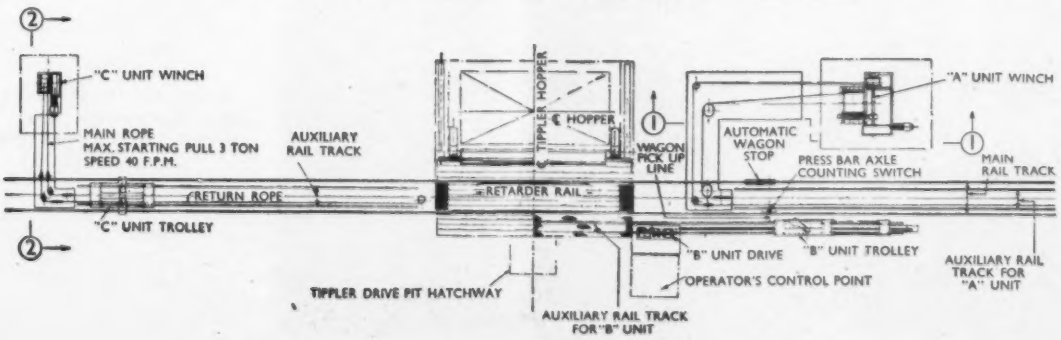
Copies of these British Standards can be obtained from the British Standards Institution, British Standards House, 2 Park Street, London, W.1. Prices: B.S. 2772 Part 1, 6s., B.S. 2772 Part 2, 4s.

VIBRATORY CONTROL GEAR

Damp and sticky materials tend to bridge in hoppers and to clog, but by use of the bin vibrators, manufactured by The Magnetic Equipment Co. Ltd., it is claimed that these materials are made readily to flow. Thus, damaging hammering on hoppers is eliminated, and in the case of low angle chutes, delivery will be greatly speeded up by properly applied vibration.

The mounting of Magco bin vibrators involves no structural alterations. In the case of steel hoppers these vibrators are bolted directly on to the plates, and in the case of concrete and heavily reinforced steel hoppers, the internal agitating plate is driven by an externally mounted vibrator.

The standard control types of vibratory control gear produced by these manufacturers includes the C.V. ventilated regulating unit for full-wave equipment, the R.V. ventilated rectifier unit supplied with half-wave equipment and the C.R.V. ventilated rectifier and regulating unit for use with half-wave equipment. Other equipments produced are adaptions of the units named.



Plan view of principal items in the Fraser and Chalmers wagon marshalling system

MINING MISCELLANY

Green May Mining and Exploration Company has arranged a $3,000,000 loan from European banks to finance a 1,000 ton per day concentrator in the Herb Lake area of Manitoba. The company recently discovered lithium deposits in this area.

★

Australia's Minister for Trade, Mr. McEwen, has said in the Federal Parliament that clarification is being sought in London on the position of Australian export of base metals under the recent proposals for a European free trade area.

★

D.N.P.M. has installed laboratory plant in Brazil to extract copper electrolytically from the Serval (Rio Grande do Sul) and Caraiba (Bahia) ores by a new process. Between 93 and 98 per cent of the metal content is extracted with reduced electric power and without the use of sulphuric acid.

★

The Magnesite AG of Radenthein has completed preparatory work for the exploitation of a new magnesite deposit found in the area of Hochfilen/Leogangen on the frontier between the provinces of Salzburg and Tirol in Austria. The company is to set up a new rotary tubular furnace at Griessen, near Leogangen. Building will start early next year and the installations are expected to be operating by 1959.

★

For the past two years Gold Mines of Kalgoorlie (Aust.) Ltd., has been carrying out work on the utilization of gold-bearing pyrite for the production of sulphur. Our Australian correspondent states that the proposition will involve the railing of pyrite to Freemantle, or the vicinity, its roasting there, and the subsequent recovery of the gold content. The roasting problem has been solved and the maintenance of a gas of suitable composition for acid making.

★

A photograph published on page 392 of our issue of October 5 was wrongly captioned the surface works of the Zinc Corporation Ltd., at Broken Hill. It was, in fact, an aerial view of the Avonmouth works of the Imperial Smelting Corporation, Ltd. To dispel any confusion, the photograph of the Avonmouth works is again reproduced, correctly captioned, together with an aerial view of the surface works at Broken Hill.

★

Opemiska Copper Mines, Ltd., and its parent company, Ventures, Ltd., have submitted plans to the Quebec Government for a smelter for Quebec's Chibougamau copper mining district.

★

The Sahara is expected to be one of the richest French overseas territories for mining sources in the near future. In a review of the progress made in the past few years in the industrialization of French overseas territories and North Africa, the French Government Planning Office said that it was intended to assign some 500,000,000,000 francs for the equipment and modernization of these territories in the next 10 years.

★

South African fire bricks made of corundum have arrived at Scunthorpe, near Hull, where they will be used to line a new blast furnace claimed to be the biggest in the world. This type of fire brick has been used with great success in the blast furnaces of the South African Iron and Steel Corporation.

★

N. V. Billiton Maatschappij has concluded an agreement with Aluminium Industrie A.G., of Lausanne, Olin Mathieson Chemical Corp. of New York and Vereinigte Aluminium Werke A.G. of Bonn, with the object of jointly prospecting for bauxite. Billiton recently applied for a concession to prospect for bauxite in Surinam at three sites situated on the rivers Coesewijne, Saramacca and Coppename, and covering a total area of 325,000 hectares.

★

Dr. W. E. Hoare, assistant director of the Tin Research Institute, left London on September 28 for a five-week visit to Canada and the U.S. to study the latest developments in tinplate and can-making technology in America.

It is understood that applications to export leaded aluminium foil scrap from the U.S. will not be charged against the quarterly quota of 4,000 short tons—recently set up by the Bureau of Foreign Commerce for the fourth quarter—if they are accompanied by evidence that the foil is unsalable in the U.S. Scrap containing seven per cent and less of aluminium will be charged against the quota only on the basis of the net weight of the contained aluminium. Primary and secondary aluminium metal and alloys in crude form will continue under the open-end licensing system. The new quota is the same as that in force for the third quarter of the current year and includes new and old aluminium scrap and remelt ingots.

★

Mining activity in Quebec has almost doubled since last year, and production for 1956 is estimated at about $400,000,000. Mr. W. M. Cottingham, the Province's Minister of Mines, reports that production already has reached $388,000,000 while the number of exploration and exploitation permits has jumped from 6,739 to 9,564. The production figure is made up of $215,781,654 worth of metal ores, $105,890,962 for industrial minerals and $60,990,217 for construction materials.

★

Local interests in Glencolumbcille, County Donegal, are pressing the Eire Department of Industry and Commerce to undertake a survey of the area's mineral resources and, in particular, to direct attention towards the disused lead and zinc deposits at Drim. The Drim mine has not been operated for more than 80 years. Samples from the workings were sent to the United States for analysis some years ago and it is stated that the result showed the presence of lead, zinc and some copper. The aim is to interest some of the Canadian mining groups now operating in the Republic to carry out a survey at these old workings in the hope that the results will warrant reopening the mines.

★

In response to an invitation by the Minister of Iron and Steel of the

The Surface Works of The Zinc Corporation Ltd. at Broken Hill, New South Wales.

U.S.S.R., issued to the United Nations Economic Commission for Europe at Geneva, a British Steel Mission visited Russia in September, 1955, jointly with delegations from Belgium, France and Sweden. The British delegation, which was led by Sir Robert Shone, C.B.E., executive member of the Iron and Steel Board, visited the Gigant iron ore mine and the Ugok ore concentrating and sintering plant at Krivoi Rog, the steelworks and wide strip rolling mills at Zaporojstal, the Nikopol tube rolling mills, and the Rustavi steelworks near Tbilisi. They then returned to Moscow where they visited the Central Scientific Research Institute of Ferrous Metallurgy and the Moscow Coke and By-Product Plant, and finally attended a meeting at the Ministry of Iron and Steel to discuss the experience they had gained from the visit.

★

New discoveries of atomic minerals continue to be reported from Brazil. The Brazil-U.S.A. group of prospectors announce the presence of 0.03 to 0.16 per cent of uranium oxide in extensive coal deposits in Sao Paulo, Parana, Santa Catarina and Rio Grande do Sul. From Minas Gerais geologists report a rich occurrence of niobium, thorium and uranium at Tapira, Municipality of Sacramento, said to be more important than that of Araxa, where 8,000,000 tons of pyrochlore contain 130,000 tons of ThO_2.

★

Mineracao Boquera has obtained a concession to exploit lead and associate metals at Macaubas, Bahia, Brazil. Permits have been granted to prospect extensive galena deposits at Vazante, Minas Gerais; samples of the ore have been sent to Germany for industrial tests. D.N.P.M. is carrying out exhaustive aerial and ground surveys of the Ribeira Valley, between San Paulo and Parana, where valuable lead mines are being worked. The Sao Paulo Government has installed plant to reduce the ores and refine the metal.

★

Responsibility for developing the technique of underground gasification of coal has been taken over from the Ministry of Fuel and Power by the National Coal Board and the Central Electricity Authority, who have agreed to plan and construct a pilot power station. The board has set up an Underground Gasification Executive to carry out their part of the project, and the necessary work will be carried out by contractors. The chairman of the executive is Mr. J. Norval. The following have been appointed as part-time members: Dr. J. Bronowski, director of the Coal Research Establishment; Mr. D. M. Clement, deputy director-general, Finance Department; Mr. W. L. Miron, O.B.E., deputy chairman, East Midlands Division; Mr. E. F. Schumacher, economic adviser to the board; and Dr. H. L. Willett, deputy director-general (safety and techniques), Production Department.

★

First shipments from the joint British-Jananese undertaking at Temangan in Kelantan, Malaya, referred to in our issue of 5/10/56, p. 397, are scheduled for August, 1957, from Tumpat on the coast north of Kota Bharu.

★

Two prospectors reported that in seven weeks they had mined £15,000 worth of tin in the Northern Territory of Australia. They have applied for a mining lease over 12 sq. miles of land near Pine Creek, about 160 miles from Darwin. Assayers said ore samples contained about 49 per cent tin.

PERSONAL

Dr. James Taylor, director in charge of the Metals Division of Imperial Chemical Industries, the biggest consumers of copper in Great Britain, arrived in Salisbury on September 27. His tour included Bulawayo and Livingstone. While in the country he planned to visit the factories of African Explosives and Chemical Industries, which are partly owned by I.C.I.

★

Mr. J. V. Franklin, managing director of Black and Decker Ltd., died in hospital on October 7 after a sudden cerebral haemorrhage. He was 56 years old.

★

Mr. J. A. Dewhirst and Mr. P. H. Ogden have been appointed local directors of George Cohen Sons & Co. Ltd., the newly-formed trading subsidiary of the George Cohen 600 Group Ltd.

★

Mr. Michael Teale has been appointed sales representative of the International Harvester Co., of Great Britain, Ltd., for Scotland and the northern part of England and Wales. He will concentrate solely on International Construction Equipment products. Formerly Mr. R. J. J. Vine acted in a similar capacity for all Great Britain and Northern Ireland. As a result of the expansion and intensification of the company's industrial activities, he will now concentrate his attention on the southern portions of England and Wales, and Northern Ireland.

★

A new private company, known as British Oxygen Research and Development Ltd., has been formed from the Research and Development Department of the British Oxygen Co. It will carry out all the research and much of the development work for the British Oxygen Group which comprises 17 home companies and 12 companies abroad.

★

In the third week of October the management and head offices of Aluminium - Industrie - Aktien - Gesellschaft are being transferred from Lausanne to a new building on the Seefeldquai in Zurich. As from October 15 correspondence intended for the general management and head office should be addressed to Feldeggstrasse 4, Zurich 34. The address of the sales department is Buckhausterstrasse 5, Zurich 48.

★

The 1956 conference of the McIntyre Research Foundation will be held at the King Edward Hotel, Toronto, on October 22, 23 and 24. It will be devoted to silicosis and other industrial pulmonary diseases.

★

The first ordinary general meeting of the Institution of Mining and Metallurgy for the Session 1956-57 will be held in the apartments of the Geological Society, Burlington House, Piccadilly, London, W.1, on October 18, 1956, at 5 p.m.

★

The first volume of a new series of textbooks dealing with all aspects of coal mining will soon be published by Sir Isaac Pitman and Sons Ltd. These books will be written by John Sinclair, Professor of Mining at University College, Cardiff. The first to appear will be "Coal Mining Economics, Organization and Management." Other books in the series will include "Environmental Conditions in Coal Mines," "Winding and Transport in Mines," "Geological Aspects of Mining," "Water in Mines and Mine Pumps," and "Coal Mining Law."

Aerial view of the Avonmouth Works of Imperial Smelting Corporation Ltd.

Metals and Minerals

Alumina from Low-Grade Ores

Of potential significance to bauxite producers is the news that the Anaconda Company is to build a $1,000,000 pilot plant at Anaconda, Montana, to test a new process for extracting alumina from low-grade domestic clays. Previous efforts to use domestic clays have failed because the processes are too costly. The plant, which will be able to treat and test about 50 s.tons of clay per day, will use clays taken from Anaconda's open-pit mines at Moscow, Idaho. The alumina will then be shipped to the company's aluminium plant in Montana, which started operations in August, 1955. The pilot plant will not be ready for about a year.

Metallurgists claim that, if the new process proves successful, it could free the U.S.—the world's largest aluminium producer — from foreign supplies of bauxite. At present more than five of every seven tons of bauxite ore now used by U.S. aluminium producers come from outside the U.S.

Alumina-bearing clays are abundant in the U.S., but the alumina content varies from 20 per cent to 40 per cent. On the basis of clays containing 20 per cent alumina, it would require 10 tons of clay to yield the two tons of alumina needed to make one ton of metal. High-grade bauxite ores from Jamaica, Surinam and the Guianas contain about 50 per cent to 60 per cent alumina. Four tons of this bauxite will make two tons of alumina. It remains to be seen whether alumina could be produced on an economic basis from a starting material of such vastly lower grade.

COLUMBIUM IN THE U.S.A.

Both the U.S. consumption of columbium metal and the world production of columbium and tantalum mineral concentrates increased in 1955, continuing the trend that started in 1954. Abundant supplies and increasing utilization of both metals were the guiding factors, according to a Bureau of Mines report. Under the U.S. Government's purchasing programme, Free World output of combined columbium and tantalum mineral concentrates increased 17 per cent over 1954 production. Though the Federal Purchase Programme ended in May, 1955, so far as foreign producers were concerned, purchase of domestic concentrates in less than 2,000 lb. lots continued until the end of the year. The upward trend in industrial uses of columbium and tantalum continued unabated, indicating stronger future markets.

Emphasis is laid in the report on the efforts being made to reduce the dependence of the U.S. on overseas suppliers. Exploration was completed last year on a promising domestic source of columbium and tantalum minerals in Bear Valley County, Idaho. Dredging operations were under way on the property at the end of the year and approximately 500 s.tons annually of concentrates containing 25-30 per cent combined pentoxides are expected to be produced yearly beginning in 1956. Another continental mineral exploration and development programme was centred on Eastern Canada, where large deposits containing pyrochlore mineral have been found near Oka, Lake Nipissing, and Champleau.

A few days ago Kennecott Copper exercised an option to acquire 51 per cent of the Molybdenum Corporation's interest in a deposit at Oka, where exploratory work has confirmed the existence of a large tonnage deposit, although problems relating to mining, processing and marketing are still in the preliminary stages of investigation.

Commonwealth producers of columbite —tantalite ores, when attempting to assess the long-term outlook, can derive some reassurance from the reflection that, sooner or later, the steadily increasing importance of columbium is bound to result in expanding markets, which will not be confined to the U.S.

Of particular significance in this connection is the news that a contract for columbium and vanadium tubes for the Dounreay experimental atomic power station, Caithness, has been placed with the Tube Investments company, Accles and Pollock, by the U.K. Atomic Energy Authority. This is believed to be the first full-scale order for columbium for use in a nuclear reactor power plant, to be placed anywhere in the world.

NEW U.S. TITANIUM PRODUCER

National Distillers Products Corporation plans to become one of the major U.S. producers of titanium metal. Its U.S. Industrial Chemicals Company division will put into operation by the end of next year a plant to turn out 5,000 s.tons annually of high-quality titanium sponge. The multi-million dollar plant will be located at Ashtabula, Ohio, near U.S. Industrial's existing sodium and chlorine facility. This plant will also house the firm's facilities for the production of zirconium, a project which was announced earlier this year. It has been claimed that the process to be used in the new plant will produce a higher purity sponge at a cost lower than that of any existing commercial technique.

"BUY TUNGSTEN NOW"

At the annual meeting of the Tungsten Institute in Los Angeles the president, Mr. D. C. W. Lunsford Long, said that the present U.S. Government stockpile would dwindle "like snow in May" under the impact of increasing consumptive need for tungsten in jet aircraft, the atomic energy programmes, and military requirements in such fields as guided missiles and armour-piercing projectiles. "The U.S. Government," he stated, "should buy to-day all the tungsten it can get at reasonable prices at home and abroad and store it underground, safe from atomic attack, as an asset for the future, indestructible and sure to be of incalculable value when the engines of to-day will be outmoded."

The entry of the U.S. Government as a large and eager buyer of tungsten ores would certainly be particularly welcome to producers at the present time! Logic compels the reflection, however, that Mr. Long's remarks are equally applicable to other materials likely to be in growing demand for high temperature applications—for example, columbium.

WORLD SHORTAGE OF DIAMONDS

Demand for all diamonds remains good and the sales figures given in our previous issue (5/10/56, p. 406) would have been even higher if larger supplies had been available. U.S. diamond dealers state that a shortage of good industrials is noticeable, but has not yet become unduly serious. They have also noted that the wholesale price of diamond dust has been climbing, although the base price from De Beers is unchanged. In the past two months New York dealers have pushed the price of diamond dust, used in abrasive wheels, up to $3.45 a carat from $3.30 a carat in July. A slight decline in the quality of industrial diamonds reaching the U.S. is regarded as reflecting the available supply of stones. One dealer is reported as stating that a price increase on diamonds could be anticipated. Although there has been no official announcement, the U.S. Government is understood to have filled its needs for the strategic stockpile.

VERSATILE MOLYBDENUM

Consumption of molybdenum concentrate in the U.S. increased 15 per cent during the first six months of 1956 compared with the same period in 1955 and was the highest since the first half of 1943. A feature of the molybdenum industry is the growth of applications outside steel, which, however, still remains by far the largest outlet. Climax Molybdenum, the world's biggest producer, now sells 10 per cent of its output for non-steel uses—roughly double the pre-war percentage. Increasing quantities are going into lubricants, paint pigments, catalysts for making petrochemicals and in electronic tubes. One of the most encouraging prospects is in high temperature alloys for jet engines.

AUSTRALIAN RUTILE PRICES

An easier tone is evident in the Australian rutile shipment market, with dealers currently indicating a price range of from £95 to £105 per l.ton c.i.f. for minimum 95 per cent material. Recently the price stood in the region of from £100 to £115 per ton. Demand is reported to have tapered off. Many users are presumably covered for some time ahead and some further easing in values would not be unexpected.

COPPER · TIN · LEAD · ZINC

ALL EYES ON DETROIT

Copper has remained a featureless market in the United States in the past week. The big producers are still quoting 40 c. per lb., the custom smelters 39 c. and the "outside" dealers at around 38 c. but their price is difficult to keep track of. No. 2 scrap copper is being bought below 31 c. per lb. which should presage an imminent fall in the custom price. The reason for the slackness is still primarily the weakness in demand from the brass mills and this in turn is explained by the failure of the automobile industry to stage a complete recovery. Workers are being taken back at Detroit but not yet in numbers to indicate a real revival.

The news from Detroit is slightly puzzling. Some of the new 1957 models (Ford's especially) were shown at the Paris Motor Show for the first time—an unprecedented step, the meaning of which is not clear. Secondly a brass mill manager is reported to have given his opinion that the car makers are anxious not to over-produce this year and this desire is responsible for the slow buying of brass products. If this is true it represents a change of policy of some significance to the copper industry for the motor giants last year consciously over-produced for fear of letting the market fall into their rivals' hands. If, indeed, the "big three" can agree to forgo their wasteful struggle for markets then copper will remain in less urgent demand.

On the whole it is doubtful whether they can. Meanwhile, other factors making for slow copper buying are the weakness on Wall Street and the realization that Eisenhower, even if passed fit, could lose this election. That is a possibility that has only emerged recently.

★

There are a number of wage contracts now being negotiated in the brass industry, the most important being at Bridgeport Brass and American Brass. Strike action has been discussed but is not yet imminent. There is a possibility of trouble at American Brass where the auto workers are seeking a higher wage increase than the company gave its employees who are enrolled in Mine-Mill.

★

Meanwhile from the Copperbelt news is coming from the commission of inquiry into unrest. For the time being reports are still about the failings of the African Union. These are obvious. What has not yet emerged from the inquiry is what to do about them. At the annual meeting of the African Congress, also taking place now, the President, Mr. Nkumbula, has said that there will be racial strife if Europeans did not allow Africans to advance in all spheres. The inter-relationship of the African Congress and the African Mineworkers' Union is, of course, one of the major complicating factors in Copperbelt labour relations.

★

Price changes in the past week include a cut of ¼ c. to 30 c. f.o.b Toronto for Inco metal, and a cut in the price of Union Minière du Haut Katanga copper to 36.80 c. per lb. at New York.

PROBLEMS FOR TIN IN MALAYA

Tin advanced by more than 1 c. per lb. but later fell back before recovering again on news from the East and currently stands at 104.75 c. per lb. for spot straits metal New York. There is no justification for any significant price change and the firmness was attributed to movements in London and the East and to the late arrival of ships in the United States. But if the background to the market is fairly stable the late arrival of ships is a condition that must be reckoned on if the Suez affair is going to continue.

The news from Malaya is to the effect that the industrial Court has given judgment against the union in its claim for payment for work on rest days to be backdated to November, 1954. This dispute, in one form or another, has dragged on for most of 1956 and it now remains to be seen whether the union will accept this decision. Three months ago, the union was in a truculent mood and one would have said no; more recently the union has become conciliatory having over-stretched its resources in numerous disputes.

Another matter which is of great significance—and one which tin interests should watch—is the present unrest among rubber producers about the dollar allocation for the import of synthetic rubber from the United States into Britain. It happens that the allocation about matches the dollar earnings of the Malayan rubber producers who are currently suffering from the slump in motor output. The Malayans are complaining that Britain is using their dollar earnings to finance a competitive product and feeling on the matter may well govern the degree of control of finance that Malaya will want during the period before the grant of full independence.

HEAVY ZINC STOCKPILE OFF-TAKE

Zinc continues to be in the doldrums in the United States with the price unchanged at 13.50 c. per lb. for Prime Western Grade East St. Louis. Occasional spurts of interest occur and give hopes of better times, but they soon bring a reaction. The industry still waits on Detroit. Meanwhile, the latest figures show that the position is being held only by very heavy government buying. September production was 90,235 tons against 89,549 in August and domestic deliveries 73,142 against 70,707 in August. Stocks fell on the month from 104,307 tons to 102,165 tons. Deliveries to the stockpile were 18,301 tons against 16,075 tons in August and only 2,427 tons in September, 1955. When the stockpiling programme began buying was only at the rate of around 15,000 tons a month.

A total of over 18,000 tons must be one of the biggest ever required in a month. The government is straining every nerve to prevent distress in mining during the election period, but authority to stockpile will in consequence be used up by the end of the year. At the beginning of 1957 the president, whoever he is, will have to decide what to do with American lead-zinc mining; a decision cannot be long delayed. It is worth recalling the marked protectionist elements in both parties' platforms. At this distance the odds look to be on higher import duties rather than more domestic stockpiling.

MORE PROTECTION FOR LEAD?

Following the spurt of buying reported last week (when the biggest total of lead was bought for any one week of 1956) lead buying has fallen off slightly. The reaction was inevitable and involves no change in the general situation. Lead buying in the United States in fact remains good and the outlook good likewise. The price is unchanged at 16 c. per lb. with the tone very firm.

American Mining Congress has passed a resolution endorsing the recommendations of the Tariff Commission (that the President ignored) for a rise in import duty on lead and zinc. The Congress also stated that foreign-mined metal should be American-refined before it could qualify for the foreign stockpiling programme. The Department of Agriculture has said that the metal must be refined abroad if it is to be bought against American farm surplus. The effect of Congress's decision would be to reduce the value of farm surpluses that could be disposed of in this way.

The London Metal Market

(From Our L.M.E. Correspondent)

Copper prices have shown a gradual declining tendency recently in the absence of any volume of buying interest. It appears that American custom smelters are willing to shade their price for any enquiries of 100 tons or more for any delivery.

It is now known that the Board of Trade will offer about half of the 36,000 tons of copper, to be released, by open competitive tender in the next few days. The balance will be sold back to the original suppliers or their sales agents. Delivery is to be spread over five months beginning November.

Tin has been relatively steady and with prompt metal not pressing on the market the backwardation has been increasing, but buying interest in Europe and the U.S. has not been spectacular. Although tension over the Suez situation is less acute than it was, there is no solution to the problem in sight, and consumers are unlikely to ignore this factor in view of the statistical position of the metal. On Thursday morning the Eastern price was equivalent to £798½ per ton c.i.f. Europe.

In lead the U.S. stockpile purchases have been a sustaining feature, but, as the original target quantities are seemingly being reached and future policy in this connection is uncertain, prices in the London market have lost ground. Consumer demand has been fair but supplies are adequate.

The zinc market until recently has been very steady, helped by stockpile purchases and the improving statistical position in the U.S. As in the case of lead, reports that the stockpile target has nearly been reached have had an unsettling effect, and prices in the London market have eased off in spite of a moderate consumer demand both here and on the Continent.

Closing prices and turnovers are given in the first table overleaf.

LONDON METAL AND ORE PRICES, OCTOBER 11, 1956

THE WEEK ON THE L.M.E.

	October 4 Buyers	October 4 Sellers	October 11 Buyers	October 11 Sellers
COPPER				
Cash	£292½	£293	£283½	£284
Three months	£291	£291½	£282	£282½
Settlement	£293		£284	
Week's turnover	4,900 tons		7,100 tons	
LEAD				
Current ½ month	£115½	£115½	£114½	£114½
Three months	£113½	£113¾	£112½	£112¾
Week's turnover	2,700 tons		3,150 tons	
TIN				
Cash	£782	£783	£789	£790
Three months	£769	£770	£772	£773
Settlement	£783		£790	
Week's turnover	765 tons		925 tons	
ZINC				
Current ½ month	£95½	£95½	£94½	£94½
Three months	£93½	£93¾	£92½	£93
Week's turnover	2,350 tons		3,200 tons	

METAL PRICES

Aluminium, 99.5%, £198 10s. per ton

Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, 6s. 11d. lb.

Cobalt, 21s. lb.

Copper, £293 per ton

ORES AND OXIDES

Bismuth	30% 5s. 0d. lb. c.i.f. 20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable) 48%	£16 15s. 0d. per ton c.i.f.
" Hard Lumpy (45%)	£16 15s. 0d. per ton c.i.f.
" Refractory 40%	£10 15s. 0d. per ton c.i.f.
" Smalls 42%	£13 15s. 0d. per ton c.i.f.
Baluchistan	£17 5s. 0d. per ton c.i.f.
Columbite, 65% combined oxides, high grade	190s./205s. per unit
Lithium Ore —	
Petalite min. 3½% Li_2O	£8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O	£8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O	£35-£40 per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 5d. nom. per lb. (f.o.b.)
Titanium Ore —	
Rutile 95/97% TiO_2	£95-£105 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2	£8½-£9½ per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	227s. 6d./231s.6d. per unit c.i.f.
Manganese Ore Indian	
Europe (46%-48%) basis 125s. freight	137d. nom. per unit c.i.f.
Manganese Ore (43%-45%)	115d. nom. per unit c.i.f.
Manganese Ore (38%-40%)	110d. nom. per unit. (including duty)
Vanadium —	
Fused oxide 90-95% V_2O_5	£12½-£13½ per unit c.i.f.
Zircon Sand (66-67% ZrO_2)	£18-£19½ per ton c.i.f.
Zirconium Oxide — Calcined Opacifier	£325 1 ton, delivered

Germanium, 99.99%, 3s. 4d. per gram

Gold, 251s. 5½d.

Iridium, £29/31 oz.

Lanthanum (98/99%) 15s. per gram

Lead, £115½ per ton

Manganese Metal (96% - 98%) £259/£265 according to quantity

Magnesium, 2s. 4d. lb.

Nickel, 99.5% (home trade) £519 per ton

Osmium, £24/27 oz. nom.

Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.

Platinum U.K. and Empire Refined £34/£35 oz.
Imported £37 15s. nom.

Quicksilver, £83 10s., ex-warehouse.

Rhodium, £42.

Ruthenium, £15/£17 oz.

Selenium, 112s. nom. per lb.

Silver, 79¼d. f.oz. spot and 79¼f'd.

Tellurium, 15s./16s. lb.

Tin, £783 per ton

Zinc, £95½ per ton

LONDON STOCK EXCHANGE PRICES, OCTOBER 10, 1956

Finance	Price Oct. 10	+ or — on week
African & European	3	.....
Anglo American Corpn.	7 1/16	+ 1/16
Anglo-French	22/6	.....
Anglo-Transvaal Consol.	1⅛	.....
Central Mining (£1 shrs.)	59/6	.....
Consolidated G'fields	60/9	.....
Consol. Mines Selection	1⅛	.....
East Rand Consols	1/9	.....
General Mining	3 3/16	+ 1/16
H. E. Prop.	8/7½	+1½d
Johnnies	42/3	+1/9
Rand Mines	3 1/32	+ 1/32
Rand Selection	1 1/32	+ 1/16
Union Corporation	41/-	+2/6
Vereeniging Estates	5 1/16	— 1/16
Wits	1 1/16	— 1/16
West Wits	35/9	—3d
Rand Gold		
Blyvoors	21/3	—3d
Brakpan	6/-	—3d
Buffelsfontein	27/4½	—9d
City Deep	10/6	.....
Consol. Main Reef	14/10½	+4½d
Crown	28/3	+2/-
Daggas	37/6	+1/3
Dominion Reefs	18/3	+1½d
Doornfontein	21/3	—6d
Durban Deep	25/-	—1/3
E. Champs	2/9	.....
E. Daggas	8/6	—6d
E. Geduld (4s. units)	27/9	.....
E. Rand Props.	43/1½	—7½d
Geduld	3 3/16	— 1/16
Govt. Areas	3/6	—1½d
Grootvlei	19/4½	—3d
Hartebeestfontein	40/10½	—6d
Libanon	7/1½	+1½d
Luipaards Vlei	12/-	.....
Marievale	19/10½	—3d
New Kleinfontein	3/4½	—3d
New Pioneer	14/6	—3d
Randfontein	35/6	—3d
Robinson Deep	8/-	—3d
Rose Deep	8/6	—1½d
Simmer & Jack	4/-	.....
S.A. Lands	1 1/16	— 1/16
Springs	2/4½	—1½d
Stilfontein	24/-	.....
Sub Nigel	1⅛	+ 1/16
Vaal Reefs	30/4½	—6d
Van Dyk	2/3	.....
Venterspost	12/10½	—7½d
Vlakfontein	15/7½	—9d
Vogelstruisbult	12/9	—3d
West Driefontein	5⅛	.....

Rand Gold contd.	Price Oct. 10	+ or — on week
W. Rand Consolidated	1 1/16	+ 1/16
Western Reefs	28/1½	—7½d
O.F.S. Gold		
Freddies	7/10½	—1½d
Freddies Consolidated	3/10½	—1½d
F.S. Geduld	4 1/16	— 1/16
Geoffries	7/10½	—1½d
Harmony	26/9	—10½d
Loraine	5/7½	—3d
Lydenburg Estates	16/-	—3d
Merriespruit	6/10½	—1½d
Middle Wits	11/1½	—1½d
Ofsits	59/3	—6d
President Brand	2 1/16	.....
President Steyn	33/4½	—1½d
St. Helena	27/10½	—1½d
Virginia Ord.	9/4½	—3d
Welkom	17/9	—3d
Western Holdings	3 1/16	.....
West African Gold		
Amalgamated Banket	1/5½	.....
Ariston	3/9	.....
Ashanti	15/3	+1½d
Bibiani	2/-	.....
Bremang	1/3	.....
G.C. Main Reef	1/9	+1½d
Konongo	1/4½	.....
Marlu	1½d	.....
Taquah	2/-	.....
Western Selection	7/9	+1½d
Australian Gold		
Gold Mines of Kalgoorlie	13/10½	+1½d
Great Boulder Prop.	11/10½	—1½d
Lake View & Star	16/6	—3d
Mount Morgan	18/9	.....
North Kalgurli	7/-	.....
Sons of Gwalia	7/3	.....
Western Mining	10/10½	+1½d
Miscellaneous Gold		
Cam & Motor	7/4½	—1½d
Champion Reef	12/4½	+1/4½
Falcon Mines	7/4½	.....
Globe & Phoenix	22/-	—6d
Motapa	9d	.....
Mysore	3/9	—3d
Nundydroog	16/6	+3/-
St. John d'El Rey	50/-	+6/-
Zams	2 1/16	.....

Diamonds and Platinum	Price Oct. 10	+ or — on week
Anglo American Inv.	9½	.....
Casts	26/4½	—1/3
Cons. Diam. of S.W.A.	10/6	.....
De Beers Defd. Regd.	5 1/16	+ 1/16
De Beers Pfd. Regd.	13¾	+ ¼
Pots Platinum	14/10½	.....
Waterval	25/6	+9d
Copper		
Bancroft	50/9	+6d
Chartered	78/3	+3d
Esperanza	3/1½	+1½d
Messina	9 1/16	+ 1/32
Nchanga	14	+ 1/16
Rhod. Anglo-American	5 1/16	+ 1/8
Rhod. Katanga	47/-	+3/9
Rhodesian Selection	50/6	+2/-
Rhokana	4 3/4	+1¼
Rio Tinto	4 1/16	— 1/16
Roan Antelope	28/7½	+1/4½
Selection Trust	4 1/16	+ 1/16
Tanks	7 1/32	+ 1/32
Tharsis Sulphur Br.	6¼	+1 1/16
Tin (Eastern)		
Ayer Hitam	21/3	+3d
Gopeng	12/4½	+1/6
Hongkong	6/1½	+3d
Ipoh	30/-	+1/6
Kamunting	10/1½	+4½d
Kepong Dredging	4/7½	+3d
Kinto Tin Mines	20/6	+3d
Malayan Dredging	13/1½	+1/7½
Pahang	13/7½	+6d
Pengkalen	17/7½	+2/4½
Petaling	8/-	+6d
Rambutan	28/6	+5/-
Siamese Tin	12/4½	+4½d
Southern Kinta	17/10½	.....
S. Malaya	10/1½	+1/1½
S. Tronoh	7/7½	—1½d
Sungei Kinta	19/-	.....
Tekka Taiping	8/1½	—1½d
Tronoh	10/6	+9d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	9/10½	—1½d
Beralt Tin	45/6	—2/3
Bisichi	4/9	+1½d
British Tin Inv.	24/3	—3d
Ex-Lands Nigeria	2/1½	+1½d
Geevor Tin	17/10½	+6d

Tin (Nigerian and Miscellaneous) contd.	Price Oct. 10	+ or — on week
Gold & Base Metal	1/1½	.....
Jantar Nigeria	4/9	+1½d
Jos Tin Area	12/6	.....
Kaduna Prospectors	1/6	.....
Kaduna Syndicate	2/-	.....
London Tin	10/3	—1½d
United Tin	1/-	.....
Silver, Lead, Zinc		
Broken Hill South	67/-	+9d
Burma Mines	4/3	+1½d
Consol. Zinc	67/-	—1/3
Lake George	15/-	+4½d
Mount Isa	25/-	+6d
New Broken Hill	52/6	—1/-
North Broken Hill	108/-	+2/-
Rhodesian Broken Hill	12/9	+10½d
San Francisco Mines	29/6	+1/-
Uruwira	4/4½	.....
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	53/-	.....
Associated Manganese	41/-	—2/3
Cape Asbestos	9/10½	—3d
C.P. Manganese	24/3	+1/6
Consol. Murchison	51/10½	+7½d
Natal Navigation	63/1½	—7½d
Turner & Newall	100/6	—1½d
Wankie	16/7½	—1½d
Witbank Colliery	5½	.....
Canadian Mines		
Dome	$25½	— ½
Hollinger	$53	+5
Hudson Bay Mining	$158	+2½
International Nickel	$198	+1½
Mining Corpn. of Canada	£9	.....
Noranda	$117	+1½
Quemont	£9½	+½
Yukon	4/9	—1½d
Oil		
Apex	45/-	.....
Attock	35/-	+2/-
British Petroleum	146/3	+9d
Burmah	93/-	—9d
Canadian Eagle	67/-	.....
Mexican Eagle	24/-	+9d
Shell	155/9	+1/9
T.P.D.	48/9	+9d
Ultramar	46/9	+1/-

Mining Finance

Market Expecting 400 per cent Final from Rhokana

After somewhat lower final distributions from Rhodesian Selection Trust and Roan Antelope Copper Mines than had been expected—which it must be stressed resulted from large allocations to reserve—the market quickly shrugged off its initial disappointment and these shares firmed up on further consideration of the strong financial position of the two companies. With R.S.T. Group payments out of the way as a market factor for another six months, current discussions on coppers now centres around the finals due from Rhokana Corporation and Rhodesian Anglo American later this month. Both these companies ended their past financial years on June 30 last.

In more precise terms the question being asked is whether Rhokana will pay a 400 per cent final—or even more—on its issued ordinary capital of £2,500,002 in ordinary and "A" stock units of £1. If this turns out to be the case, total distribution—including the interim last March of 120 per cent—would amount to 520 per cent gross compared with only 420 per cent gross in respect of 1954-55.

There is, of course, every possibility that sufficient profits will have been earned to make such an increase in distribution possible. Of course, as for Roan and Mufulira, costs per ton of metal produced must have moved up possibly by some £15 a ton. But this is not significant when viewed against prices received for copper sold during the past year which could have averaged something over £360 a ton compared with about £310 a ton previously. Production should also have been somewhat higher.

Besides this, Rhokana's investment income has been substantially stepped up. Its holding in Nchanga Consolidated will reflect the increase in that company's dividend from 180 per cent to 240 per cent for the past year ended March 31, 1955, while the stake in Mufulira will have boosted revenue from this source by some 25 per cent. Rhokana's holdings in these two companies at the time of its last report was 33.6 per cent and 26.46 per cent respectively. Taken together, all these factors add up to the distinct possibility that Rhokana could pay the 400 to 420 per cent expected of it. But whether or not this will be the case seems to depend largely on whether the company intends to place more than the 1954-55 figure of £3,500,000 to reserve.

As is well known all Copperbelt companies are committed to providing funds for development of the Kariba hydro-electric power project which will require enormous sums of money over the coming few years. In addition, Rhokana has lately tended to develop into a holding company apart from its direct mining interest, and it must be prepared to support the development and expansion of the companies in which its interests lie. A notable example of this is Bancroft Mines in which it holds 47.2 per cent. It is generally considered in mining circles that this property—whose production target has already been doubled from that envisaged in the original prospectus—will most likely enlarge its operations considerably as time progresses.

In contrast to the R.S.T. Group, Rhokana declares dividends before deduction of Northern Rhodesian taxes of 7s. 6d. in the £. If, therefore, a total amount of 520 per cent is to be paid in respect of the past financial year, these taxes must be deducted before yield calculations are made. In effect, the figure of 325 per cent which would thereby remain, would show an indicated yield on the £1 shares at their present price of about £43 of 7½ per cent. When compared with returns from individual Copperbelt companies of around 10 to 11 per cent, this might appear unduly low. But as in the case of R.S.T. (which the market also places on a low yield basis) Rhokana must be given credit for its growth prospects.

Expected at the same time as the Rhokana dividend is a final declaration from Rhodesian Anglo American. This company's main dividend paying holdings comprise a 52.4 per cent stake in Rhokana; 21.3 per cent in Nchanga. Although dividend income earned by Rho-Anglo during its year ended June 30, 1956, must so far have risen substantially above that of the previous 12 months, the company's dividend prospects still depend largely upon the Rhokana final.

By and large it would not seem unreasonable, therefore, to expect a 70 per cent final net of Rhodesian taxes from Rho-Anglo which, together with the interim of 20 per cent net payment last March, would make up 90 per cent net for the year against 77½ per cent net for 1954-55. Should this be the case the indicated yield from this company's 10s. stock units at their present price of 112s. would be 8 per cent.

Since we last wrote about the outlook for copper shares in the September 7 issue, little has occurred to change the encouraging long-term outlook for the metal. Recently the decline of Suez as a market factor has tended to pull prices back. This, together with the settlement of Copperbelt labour troubles has resulted in immediate demand not fully absorbing the supplies available. Yet, such considerations are essentially short-term, and in the more distant outlook if it can be assumed that the copper price will average out close to £300 a ton, the outlook for future Copperbelt dividends gives grounds for optimism. Indeed, heavy allocations to reserve during exceptionally profitable times may eventually be seen by investors in retrospect as having been a wise policy.

KOLAR NATIONALIZATION

Viewed broadly, the most significant thing to emerge from the nationalization of Kolar Gold Mining Companies is the apparent eagerness exhibited by the Central Government of India to demonstrate an attitude of fairness towards British capital. This is understandable as the larger part of investment in India emanates from the United Kingdom, besides which India's current five-year plan cannot be financed from internal resources alone and depends largely upon an uninterrupted flow of foreign capital into the country.

However, from the viewpoint of Mysore, Champion Reef, and Nundydroog (K.G.F.) gold companies—the three properties which are to be taken over—such statesman-like considerations must naturally take second place to the question of whether compensation allowed is, in fact, adequate or not. The overall, or "global" figure of Rs.164 lacs—or £1,230,000—has been allocated as to £357,825 for Mysore, £396,075 for Champion Reef and £476,100 in respect of Nundydroog. These figures work out at 4s. 4d., 12s. 2d. and 16s. 10d. per share respectively, added to which some further small amounts representing liquid assets owned by the mines' three London holding companies must be taken into account. Nevertheless, seen against London Stock Exchange prices in the latter part of September of about 1s. 3d., 6s. 3d. and 9s. respectively, these figures are not unattractive. Moreover, speaking on behalf of the companies, Mr. Arthur Taylor has gone to great pains to stress that he considers the offer "fair and reasonable". Certainly, it is a great improvement on the original bid of only Rs.87 lacs, or £652,500. Yet it is also important to remember that in the past the properties have been valued as high as Rs.8 crores, or £6,000,000. In addition, the threat of nationalization, together with other adverse factors, has combined to exert a depressing influence on the companies' shares over the past few years.

Against all this, as Mr. Taylor points out, dividends have recently been much reduced; the mines are amongst the deepest in the world; future costs are likely to rise, and technical problems are increasing. Furthermore, the leases have only some 14 years to run.

By and large, therefore, this seems to be no time for looking a gift horse in the mouth. Indeed, it is difficult to imagine anyone, apart from the governments of India and Mysore, being interested in buying the Kolar Gold Mines at all—let alone at a figure of £1,230,000. Theoretical valuation is one thing, but to effect a sale is another. Under these circumstances, shareholders should on the whole be satisfied at being able to dispose of a not particularly attractive investment at so high a figure.

Dealing with the technicalities of the operation, compensation is to be paid in cash as to three-quarters on vesting day—which will be not later than November 20—and one-quarter within three months thereafter. The companies have been promised that permission to remit this money to the United Kingdom will be given promply and without difficulty. Finally, Mr. Taylor has stated that there will be no delay in the ultimate liquidation of London holding companies. Shareholders should, therefore, receive what is due to them without any undue delay or difficulty.

WINKELHAAK OBTAINS 681 INCH DWTS.

A quarterly report in respect of three months ended September 30, 1956, has given details of encouraging first development values obtained by Winkelhaak Mines situated in the Bethal area of the Far Eastern Rand. From a total of 872 ft. accomplished in the No. 3A ventilation winze, of which 385 ft. were sampled and 185 ft. found payable, values of 14.2 dwt. of gold over 48 inches—equivalent to 681 in. dwts—were disclosed. As this figure was reached after application of the Union Corporation discount factor, the value could be taken to be more in the region of 900 in. dwt.

Further surface drilling has been undertaken to determine geological structures and reef characteristics in the shallow south-east corner of the mine. This section was very sparsely drilled by the prospecting company. To date it is stated, seven boreholes have been completed while two others are in progress In three of these holes, the reef was faulted out but in one value of 307 in. dwt. was revealed. Three more holes yielded results in the order of 75 in. dwt. A slight loss of core was apparent in some instances.

GOPENG GROUP'S REPAYMENT PROPOSALS

Gopeng Consolidated, together with associated companies, have announced plans for capital repayments to shareholders of five tin-producers. These have been under consideration for some time and are now complete for three companies. Amounts to be repaid in respect of the remaining two properties have yet to be determined.

In the case of Rambutan the amount proposed is 7s. 6d. per share; for Tekka 2s. 6d. per share; and for Kent (F.M.S.) Tin Dredging 1s. per share. Repayments for Gopeng Consolidated and Pengkalen are awaiting determination.

It is emphasized that these returns are not "panic repayments" but the natural development of financial policies which have resulted from an investigation of positions and commitments over a number of months. The returns can, it is stated, be made without reducing the companies' earning power.

PLANS FOR CAMP BIRD MINE

The Camp Bird mine plans to resume full-scale production in Colorado, U.S.A. Milling will accordingly be started on a substantial scale in 1958. A circular to shareholders of Camp Bird has stated that initial work in the past year has disclosed the existence of considerable mineral deposits showing excellent values in gold, silver, copper, lead and zinc.

COPPERS FEATURED AMONGST MINING ISSUES

For some time London markets have remained firm in the face of Wall Street falls, and it was therefore surprising that a gain of 6.08 points in *The Dow Jones Industrial Index* should, over the past week have had as its counterpart a decline of 1.8 points in *The Financial Times Industrial Ordinary Index*. Although political considerations, Suez and tight money, still remained major market factors in the U.S., some investment demand—led mainly by heavy industrial shares—was stimulated by optimistic forecasts of fourth-quarter business prospects. In London, some confidence was engendered by Mr. Macmillan's statement that the U.K. had earned a surplus of £144,000,000 during the first six months of 1956. But falling industrial profit margins, together with the possibility of new capital issues, were responsible for the quiet tone which prevailed. Copper shares were outstanding amongst mining issues which, on the whole, made a good showing.

Disappointment over R.S.T. Group dividends was quickly shrugged off, and coppers moved ahead. Particularly strong were Rhokana and Rho-Anglo, while Tanks and Messina both rose in front of impending dividend announcements.

Some useful gains were made by selected Kaffirs including Union Corporation, Crown Mines, Daggafontein and Sub Nigel, but O.F.S. shares were inclined to be weak. *The Financial Times Gold Share Index* declined 0.5 points to 76.9.

Assisted by capital repayment proposals from the Gopeng group, Malay tins made small advances throughout the list. Diamonds were little changed in spite of the recent good sales figures, while Indian golds fully held their recent advances. S.W. Africa Co. gave up about 2s. and St. John d'el Rey again reached 50s. on speculative demand.

FINANCIAL NEWS AND RESULTS IN BRIEF

Higher Dividends from R.S.T. and Mufulira.—A final dividend of 80 p.c.—making a total of 120 per cent (95 per cent) for the year ended June 30, 1956, has been declared by Rhodesian Selection Trust. This company owns 63.98 per cent of Mufulira Copper Mines. During the past financial year R.S.T.'s net profit rose to £4,302,363 from £3,452,502. Dividends absorbed £4,241,130 (£3,357,531) and £39,418 (£31,342) remained to be carried forward.

Mufulira has declared a final dividend of 85 per cent making 125 per cent for the year ended June 30, 1956, compared with 100 per cent for 1954-55. The company's net profit was £9,289,793 compared with £6,393,958. Dividends absorbed £6,886,554 (£5,509,244) and £125,516 (£42,861) remained to be carried forward. Sir Ronald Prain is president and chairman of both companies whose meetings will be held in London on December 14.

65 Per Cent. Final From Roan.—Roan Antelope Copper Mines is to pay a final of 65 per cent thereby raising its distribution in respect of the year ended June 30, 1956, to 100 per cent from 80 per cent in respect of the previous year. After taxation the company earned net profits of £8,358,513 against £5,922,759. Dividends absorbed £5,617,305 against £4,493,844, and £26,542 (£71,608) was carried forward. Meeting, London, December 13. Sir Ronald Prain is chairman and president.

Uruwira Minerals.—Overall assets of Uruwira Minerals at March 31, 1956, of £3,091,933 compared with the preceding year's figure of £3,115,049. During the past financial year the company made a net loss of £38,030 (£266,424) which was transferred to development account.

It will be recalled that Uruwira's pilot mill was shut down on May 12, 1955, which was also the date on which the new mill officially became operative. Although the new crushing section came into production in April, the fine grinding and flotation section did not commence until May. The Heavy Media section started up in June.

N. Broken Hill Pays 30 Per Cent More.—With the recommendation of a final dividend of 130 per cent (100 per cent) North Broken Hill, the Australian base metal producer, is raising distribution on its £A700,000 one-class capital by 30 per cent to 210 per cent for the year ended June, 1956. Profits earned moved up to £A3,407,797 from £A.3,185,095. Depreciation took £A100,000 (same) and provision for taxation and royalty at £A1,282,500 compares with £A1,074,000 previously. A net balance of £A2,025,297 remained against £A2,011,095. The report and accounts will be issued next month.

De Beers Industrial.—In order to liquidate the loan of £1,500,000 made available to De Beers Industrial Corporation for an expansion by De Beers Investment Trust, arrangements have been made whereby the loan will be free of interest from October 1, 1956, and will subsequently be liquidated by the latter company taking up 1,000,000 ordinary shares in De Beers Industrial at 32s. 6d. per share on January 2, 1957. This operation will also provide £125,000 in cash. The Corporation is confident that the present dividend rate can be maintained on the increased capital.

Subsidy for Mazapil Expansion ?—At the meeting of Mazapil Copper Mr. T. P. Berington, the chairman, gave details of an expansion programme which is to be undertaken by the company. Newly developed ore reserves at the Kata Arroyo mine, he said, alone were sufficient to justify the installation of underground facilities permitting extraction at the rate of about 1,000 tons of ore per day, together with the erection of an efficient modern mill. Despite the company's improved financial position (net current assets at the end of 1955 rose to £358,139), the cost of the larger mill, together with expenditure on mine equipment, was beyond present financial resources.

Mr. Berington stated, however, that the expansion project qualified in all respects for a subsidy under a new law introduced by the Mexican government in January, 1956, and an application had accordingly been made. Increased capacity and improved metallurgical efficiencies to be expected from the plant would treble the present production of copper in concentrates and substantially reduce costs.

During the year ended December 31, 1955, Mazapil made a group net profit after taxation of £115,278 (£38,587).

B.P.'s Bid for T.P.D.—As a result of negotiations between The British Petro-

leum Company and Trinidad Petroleum Development Company, an offer has been made for the whole of the ordinary stock of T.P.D., the terms of which are as follows :—

For the 2,000,000 T.P.D. ordinary units of 5s. held by the Liquidator of British Controlled Oilfields, a cash payment of 47s. 6d. per unit—ex the final dividend for the year ended July 31, 1956.

For units held by other ordinary stockholders, one £1 unit of B.P. ordinary stock for three T.P.D. stock units.

It is understood that T.P.D. propose to recommend a final dividend of 50 per cent gross and that B.P. has raised no objection to this rate being paid.

Blinkpoort To Pay 5 Per Cent Maiden.—Blinkpoort Gold Syndicate has declared a maiden dividend of 5 per cent (or 3d. per share) on its issued ordinary capital of £625,000 in 5s. shares. The company's financial year has been changed to September 30 from June 30. The company report and accounts will, therefore, cover the period of 15 months from July 1, 1955, to September 30, 1956. This alteration has been made in order that the financial year-end should coincide with that of the O.F.S. mines in which its interests lie.

Blinkpoort's O.F.S. shareholdings are as follows :—

F.S. Geduld ...	1,199,916	shares
P. Brand	104,625	,,
P. Steyn	69,052	,,
Welkom	93,000	,,

Taquah and Abosso.—Balance sheet figures at March 31, 1956, showed a decline in total assets to £924,207 from £1,383,691. Current assets of £77,824 exceeded current liabilities by some £46,000. Net profits during the past financial year at £1,769 compared with the previous year's loss of £12,220. After a transfer of £20,000 from general reserve, and writing off £303,294 an adverse balance of £209,117 was carried to the balance sheet.

It will be recalled that Taquah and Abosso ceased operations in November last year due to a strike of African mine employees. Negotiations have now been completed in London for the sale of major items of plant and machinery and it is considered that the company should be put into voluntary liquidation. A special resolution to effect this will be proposed at the meeting to be held in London on October 30. Mr. Robert Annan is chairman.

Kramat Pulai.—Total assets of Kramat Pulai at March 31, 1956, contracted to £166,547 from £183,999. Current assets of £105,696 exceeded current liabilities and future taxation by almost £71,000. Net profit after taxation more than doubled at £9,889 against £4,608 previously. Dividends of 6d. per share absorbed £5,750 (same) while a special dividend of 2s. per share in respect of past accumulated profits cost £23,000 (nil). After meeting additional profits tax of £8,415, attributable to the special dividend, unappropriated balance declined sharply to £3,968 from £31,244. Mr. E. V. Pearce is chairman. Meeting, London, October 8.

Anglo-Burma Tin.—A new Joint Venture company—Anglo-Burma Tin Company (1956)—has been registered in Burma and the agreement, under which Anglo-Burma Tin's physical assets in Burma are being sold to the newly-formed company, has accordingly been executed. The consideration involved was 1,100,000 shares of one kyat each.

Esperanza Meeting Date.—The annual general meeting of The Esperanza Copper and Sulphur Company will be held on November 29, 1956. In the meantime, no further progress report will be issued, and shareholders are asked to wait for the chairman's review which will be posted with the report and accounts on November 5.

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Write, Director of Recruitment, Colonial Office, London, S.W.1, stating age, qualifications and experience, quoting BCD 99/60/02.

KRAMAT PULAI

MR. E. V. PEARCE'S STATEMENT

LARGER PROFIT

The forty-eighth annual general meeting of Kramat Pulai, Ltd., was held on October 8 at the Registered Office, 73 Cheapside, London, E.C.

Mr. E. V. Pearce, A.M.I.M.M., Chairman, presided.

The following is his statement circulated to shareholders:

The working profit for the year ended March 31, 1956, of £20,387 exceeded that of the previous year by £3,654. After making provision for taxation and a small expenditure on prospecting the net profit for the year was was £9,889, an increase of £5,281 on that of the year ended March 31, 1955.

The Directors recommend the payment of a dividend of 3d. per share and a bonus of 3d. per share both less Income Tax at 8s. 6d. in the £ which, if approved, will absorb £5,750. The unappropriated balance of Profit and Loss Account carried forward to the current year is £3,968.

From the credit side of the Profit and Loss Account it will be seen that total Revenue exceeded that of the previous year by £4,360. Of this amount £3,036 was due to increases of £1,376 in the item "Tribute and Sundry Revenue at Mine," which includes the profit of £1,045 on the sale of Corundum mentioned in the Acting Manager's Report, and £1,660 in the item "Profit on Sale of Scheelite." Notwithstanding a decrease of about eight tons in the production of Tin Concentrates the Revenue from this source was some £330 higher than that of last year. This was due to an increase of about £30 per ton in the price of Tin on the Singapore market.

Scheelite and Corundum

Production of Scheelite declined by about 8½ tons but this was more than compensated for by an increase of £243 16s. 0d. per ton sold. The highest price realized was £1,000 16s. 0d. per ton delivered New York for material which assayed 74.41 per cent Tungstic Oxide, and the lowest £938 10s. 0d. per ton for material which assayed 74.19 per cent. The current price for high grade material such as we produce is about £925 per ton.

The sale of a parcel of Corundum is interesting for, as far as we are aware, it is the first shipment of any size that has ever been made from Malaya—there is an accumulation of this mineral on the property resulting from former mining operations for Tin and Scheelite and although the profit per ton is small, it will add grist to the mill, if our endeavours to find a regular market for it are successful.

Although we have not yet received a Mining Lease covering the Kampong Binjai area we have been informed that our application has been approved by the State Council, on terms which are now being considered. Subject to acceptance of the terms, we are now assured that a mining lease will be issued in due course.

Aokam Tin

Regarding Aokam Tin Limited, there has been some delay in completing the Grab Dredge owing to late deliveries of material from the United Kingdom. However, the dredge is now almost complete, and according to our latest information, it is expected that she will proceed to the area to be dredged in November.

From the Acting Manager's Report, it will be seen that there was increased Terrorist activity in the neighbourhood of the property notwithstanding the fact that there was a considerable improvement in Malaya generally. The Pulai Valley, in which our property is situated, is one of the black spots in the country, and our thanks are due to the Military and Police for their services in protecting the area.

In conclusion, the Directors wish to express their appreciation of the services rendered by Mr. Meikle, the Manager, Mr. Lapsley, the Acting Manager, and the Asian employees for the services rendered by them.

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Tons milled .. 897,000 **Gold produced .. 345,579 Oz. fine**

		Per ton milled
Working Revenue	£4,335,521	£4 16 8
Working Expenditure	2,544,237	2 16 9
Working Profit—from gold, etc.	1,791,284	1 19 11
from uranium (subject to adjustment)	1,059,471	1 3 8
Total	2,850,755	£3 3 7
Expenses *less* Sundry Revenue	128,714	
	2,722,041	
Taxation	172	
Profit after Taxation		£2,721,869
Transfer for Expenditure on mining assets and trade investments	1,276,420	
Repayment on account of capital portion of Uranium Loan	260,114	
		1,536,534
Balance of Income and Expenditure Account at 30th June, 1956		£1,185,335

The **Ore Reserve** was re-estimated as at 30th June, 1956. This estimate, together with that of the previous year, is as follows :—

Reef	Available			Shaft and Safety Pillars			Total		
	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.	Tons (000s)	Value Dwt.	Width In.
Basal ..	1,700	8.5	54.3	146	8.2	56.9	1,846	8.5	54.5
Previous year	931	8.0	57.9	126	6.7	66.3	1,057	7.8	58.8

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO., 4, London Wall Buildings, London, E.C.2.

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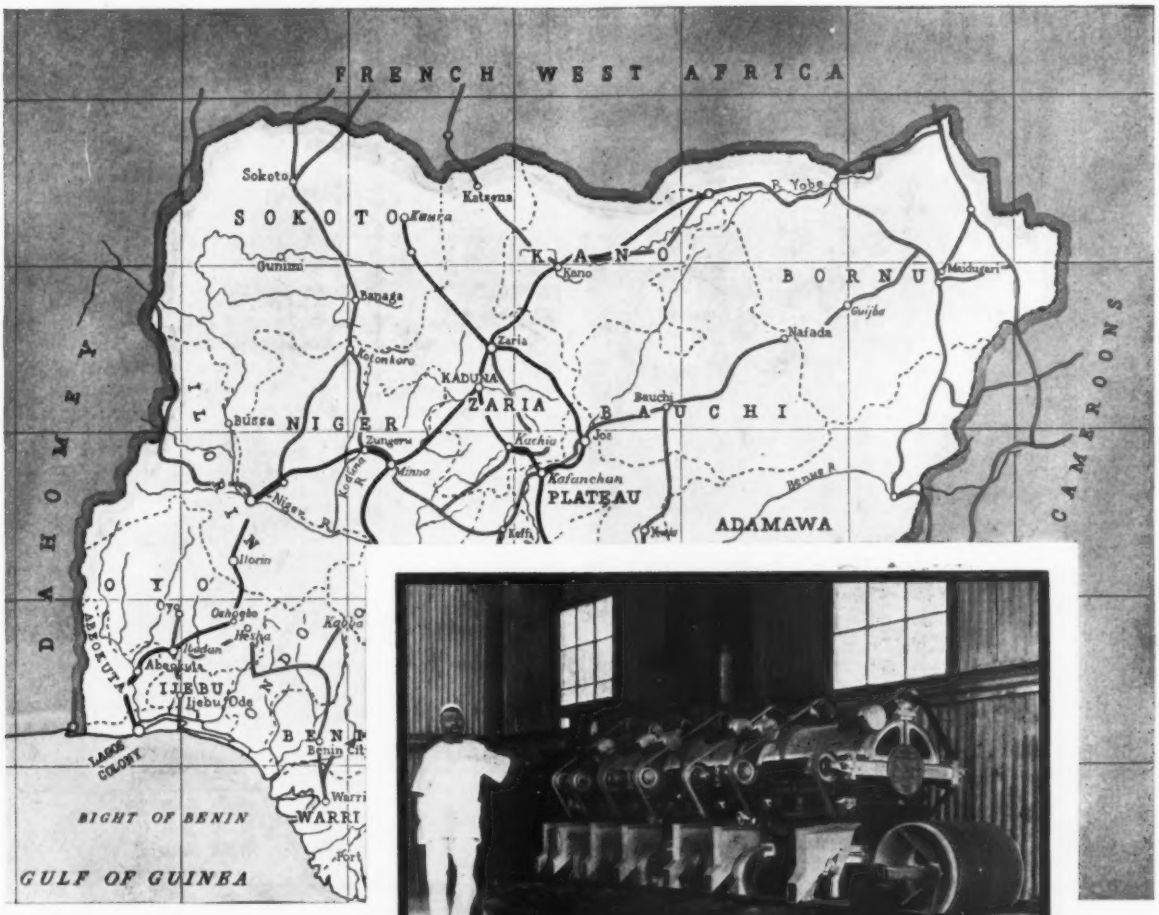

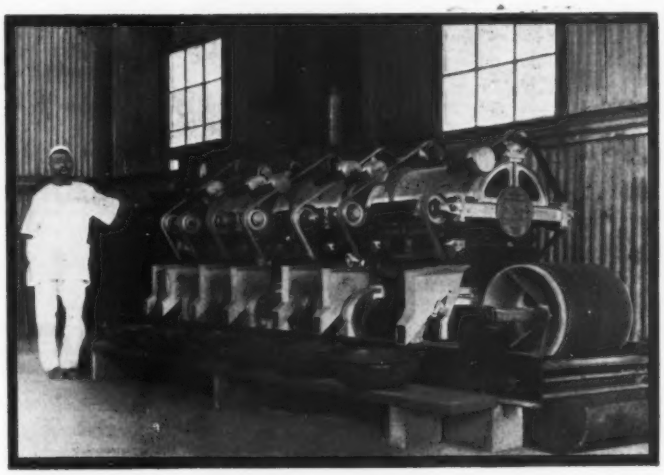

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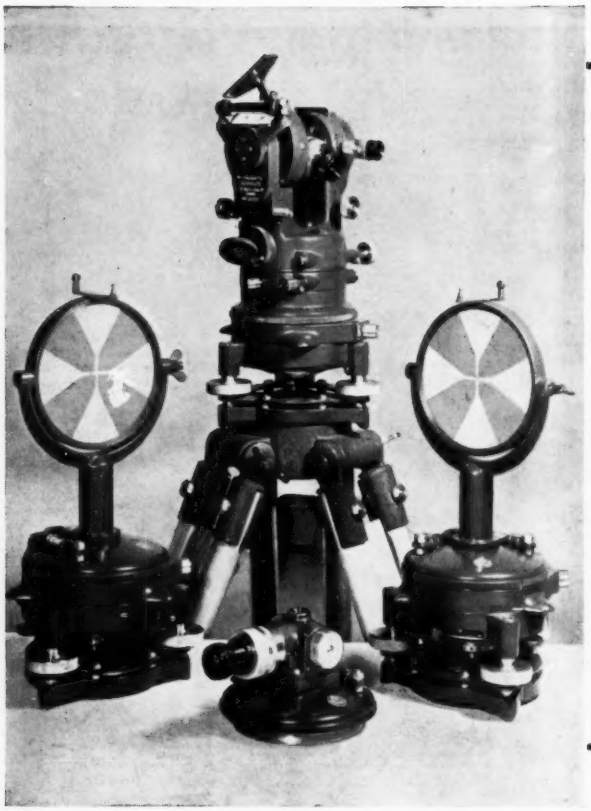

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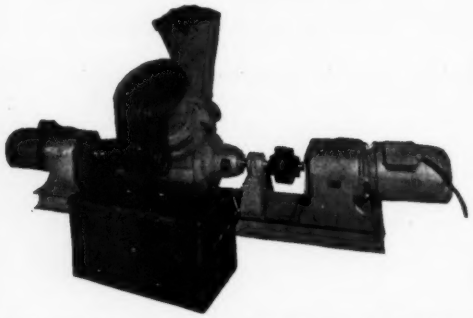

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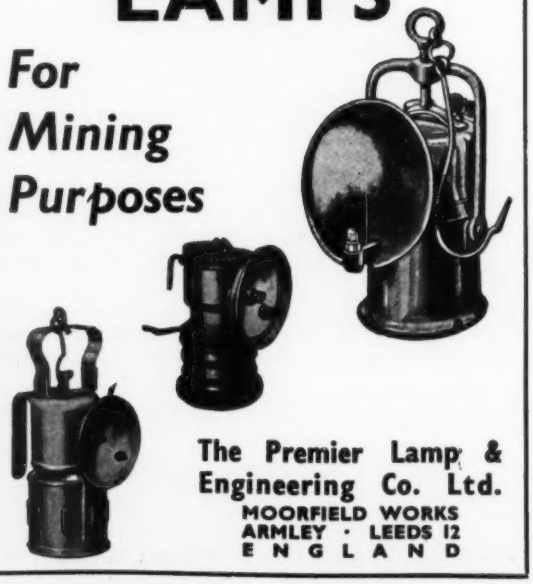

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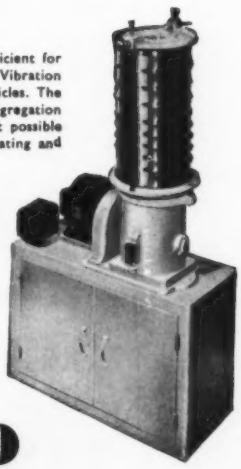

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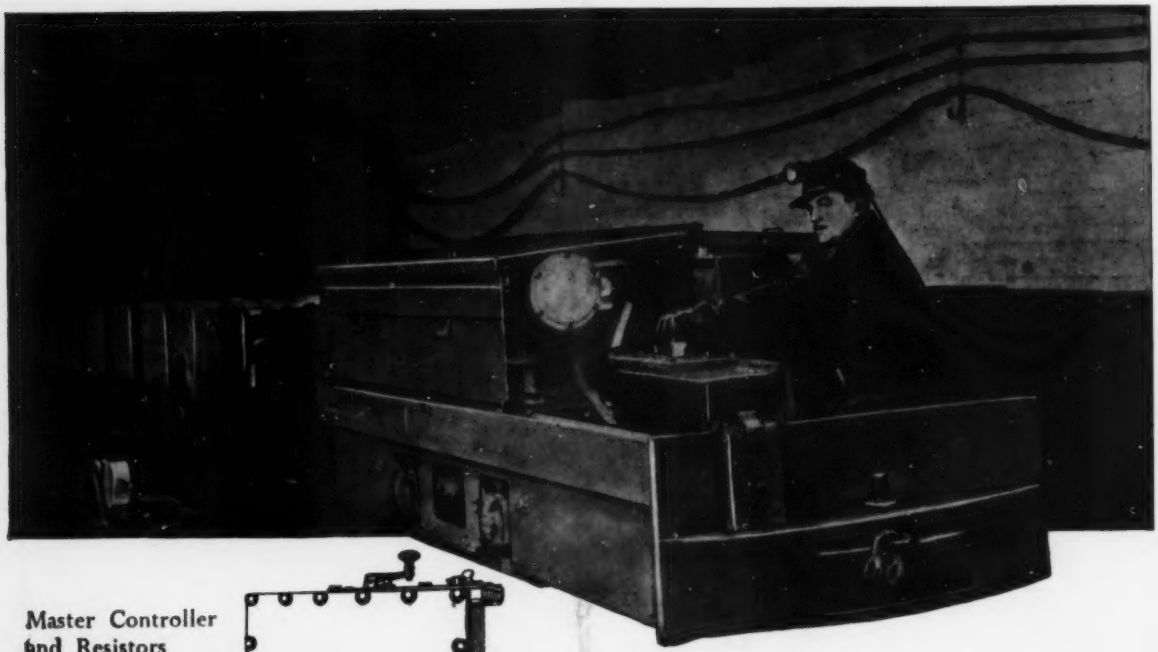

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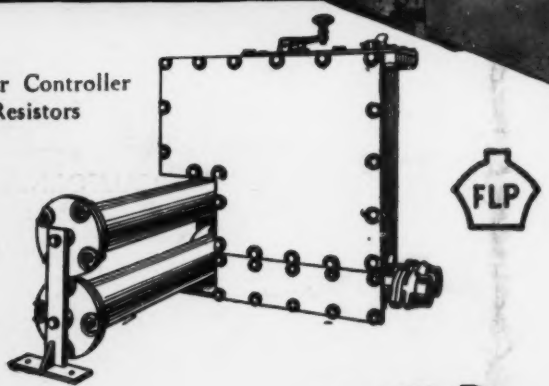

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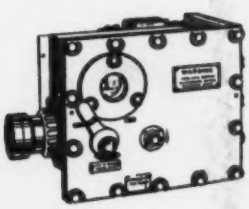

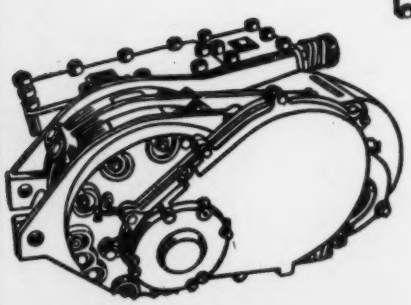

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